Vol. 997 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

August 5, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 5, 1980 Volume 997 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of June 1980

Affirmed	166
Affirmed in part	25
Reversed	64
Total	255

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,275,487, Re. S.N. 146,260, Filed May 5, 1980, Cl. 156/072, METHOD AND AUTOMATIC APPARATUS FOR PRODUCING PILE SURFACED PLASTIC SHEETING, Jerome H. Lemelson, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 161

3,668,050, Re. S.N. 137,980, Filed Jun. 12, 1980, Cl. 128/132 R, SURGICAL DRAPE, Harold F. Donnelly, Owner of Record: *Kimberly-Clark Corporation, Neenah, Wis.,* Attorney or Agent: C. Frederick Leydig, et al., Ex. Gp.: 335

3,950,780, Re. S.N. 153,538, Filed May 27, 1980, Cl. 358/28, VIR CHROMA SYSTEM, Harry T. Freestone, Owner of Record: *General Electric Company, Portsmouth, Va.,* Attorney or Agent: Stanley C. Corwin, et al., Ex. Gp.: 233

4,040,425, Re. S.N. 063,355, Filed Aug. 2, 1979, Cl. 128/303.14, POULTRY BEAK REMOVER, John S. Goodling, et al., Owner of Record: *Huburn Research Foundation, Auburn, Ala.,* Attorney or Agent: G. William King, et al., Ex. Gp.: 335

4,058,560, Re. S.N. 150,195, Filed May 15, 1980, Cl. 562/583, CHEMICAL PROCESS, Thomas J. Walter, Owner of Record: *Ethyl Corporation, Baton Rouge, La.,* Attorney or Agent: Donald L. Johnson, et al., Ex. Gp.: 126

4,069,217, Re. S.N. 135,455, Filed Mar. 31, 1980, Cl. 260/124 R, SOLUBILIZED LIGNOSULFONATE DERIVATIVES, William J. Detroit, et al., Owner of Record: *American Can Company, Greenwich, Conn.,* Attorney or Agent: Robert P. Auber, et al., Ex. Gp.: 125

4,123,869, Re. S.N. 125,247, Filed Feb. 27, 1980, Cl. 431/1, GOOSE AND DUCK BLIND, Gordon Witt, Owner of Record: *Inventor,* Attorney or Agent: Ernest Peter Johnson, Ex. Gp.: 323

4,127,593, Re. S.N. 152,245, Filed May 22, 1980, Cl. 260/348.37, EPICHLOROHYDRIN PURIFICATION PROCESS, Leo Kim, et al., Owner of Record: *Shell Oil Company, Houston, Tex.,* Attorney or Agent: Ronald L. Clendenen, et al., Ex. Gp.: 121

PATENT NOTICES

Certificates of Correction for the Week of Aug. 5, 1980

Re. 30,244	4,173,584	4,192,621	4,200,712
3,857,651	4,176,140	4,192,696	4,200,732
3,859,588	4,176,200	4,192,706	4,200,751
3,872,836	4,176,702	4,192,898	4,200,811
3,879,960	4,178,613	4,193,571	4,200,968
3,913,721	4,180,228	4,193,597	4,201,503
3,970,676	4,180,869	4,193,788	4,201,778
3,971,747	4,181,222	4,193,896	4,201,983
4,007,145	4,181,299	4,194,019	4,202,169
4,029,061	4,181,600	4,194,349	4,202,194
4,046,457	4,181,651	4,194,546	4,202,502
4,046,633	4,181,707	4,194,659	4,202,649
4,082,972	4,181,923	4,195,609	4,202,711
4,084,488	4,182,159	4,195,920	4,203,002
4,104,385	4,182,337	4,196,336	4,203,145
4,107,315	4,182,389	4,196,651	4,203,150
4,124,778	4,182,644	4,197,708	4,203,308
4,143,390	4,182,922	4,197,784	4,203,334
4,144,079	4,183,014	4,197,894	4,203,452
4,146,834	4,184,094	4,198,032	4,203,490
4,155,242	4,184,239	4,198,106	4,203,566
4,156,068	4,184,657	4,198,139	4,203,611
4,156,413	4,185,101	4,198,213	4,203,785
4,156,458	4,187,357	4,198,271	4,203,873
4,157,563	4,187,436	4,198,272	4,203,888
4,160,756	4,187,809	4,198,355	4,204,296
4,161,815	4,188,336	4,198,420	4,204,469
4,166,072	4,188,393	4,198,435	4,204,572
4,166,627	4,188,577	4,198,600	4,204,760
4,166,853	4,188,977	4,198,839	4,204,966
4,167,846	4,189,543	4,199,140	4,205,190
4,168,399	4,189,606	4,199,416	4,205,351
4,169,184	4,189,775	4,199,628	4,205,384
4,170,651	4,189,897	4,199,660	4,205,559
4,170,893	4,190,109	4,199,663	4,205,637
4,171,369	4,190,695	4,199,698	4,206,086
4,171,435	4,191,110	4,199,835	4,206,089
4,172,111	4,191,702	4,199,839	4,206,127
4,172,198	4,191,961	4,200,117	4,206,411
4,172,813	4,192,098	4,200,187	4,206,425
4,173,144	4,192,614	4,200,467	4,206,428
			4,207,045

Disclaimers

4,183,519.—*Willard Chester Harris,* Rochester, N.Y. SHEET REGISTRATION MECHANISM. Patent dated Jan. 15, 1980. Disclaimer filed June 16, 1980, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,170,141.—*Lecon Woo,* Wilmington, Del. METHOD AND APPARATUS FOR MEASURING THE LOSS MODULUS OF MATERIALS. Patent dated Oct. 9, 1979. Disclaimer filed June 11, 1980, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to the remaining term of said patent.

Design No. 250,091.—*Donald K. Jewell,* Naperville, Ill. BEVERAGE CONTAINER CARRIER. Patent dated Oct. 31, 1978. Disclaimer filed Apr. 28, 1980, by the assignee, *Keyes Fibre Company.*

Hereby enters this disclaimer to the sole claim of said patent.

Disclaimer and Dedication

3,860,536.—*Richard G. Landwerlen,* Indianapolis, Ind., and *Theodore H. Kritchevsky,* Chicago, Ill. ENZYME-DETERGENT COMBINATION. Patent dated Jan. 14, 1975. Disclaimer and dedication filed June 11, 1980, by the assignee, *CPC International Inc.*

Hereby disclaims and dedicates all claims of said patent to the Public.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent 4,181,590. Method of Ion Plating Titanium and Titanium Alloys With Noble Metals and Their Alloys. Filed Sept. 12, 1978. Patented Jan. 1, 1980. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Program Agreements and Patent Branch, Administrative Service Division, Federal Bldg., Science and Education Administration, Hyattsville, Md. 20782

Patent application 6–110,864. Preparing Entomocidal Products With Oligosporogenic Mutants of 'Bacillus Thuringiensis.' Filed Jan. 9, 1980.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C Sts. NW.
Washington, D.C. 20240

Patent application 6–085,450. Modified Sulfur Cement. Filed Oct. 16, 1979.

Patent application 6–085,451. Combined Rotating Bed Mechanical Dust Collector and Water Droplet Eliminator. Filed Oct. 16, 1979.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–045,368. Reference Map Generation Method. Filed May 31, 1979.

Patent application 6–056,767. Reversible Plasticizer for Solid State Deformation Processes. Filed July 12, 1979.

Patent application 635,472. Chemical Encapsulation and Distribution. Filed Nov. 26, 1975.

Patent application 675,671. Combustion System Using Dilute Hydrogen Peroxide. Filed Apr. 9, 1976.

Patent application 680,003. An Improved Electron Beam Tube. Filed Apr. 23, 1976.

Patent application 686,768. Device for Stimulation of Geothermal Wells. Filed May 17, 1976.

Patent application 723,880. Liquid Propellant Gun. Filed Sept. 16, 1976.

Patent application 705,223. Composite Dome. Filed July 14, 1976.

Patent application 705,732. Infrared Imaging Device. Filed July 15, 1976.

Patent application 702,541. Low Altitude Optical Altimeter. Filed July 6, 1976.

Patent application 702,641. Fuel Injection With Flameholding. Filed July 6, 1976.

Patent application 702,642. Fluidic Combustion Control of a Ramjet. Filed July 6, 1976.

Patent application 705,733. Shock Buffer for Liquid Propellant Gun Projectile. Filed July 15, 1976.

Patent application 706,869. Explosive Closure Value. Filed July 19, 1976.

Patent application 708,253. Edge Detection Analyzer. Filed July 23, 1976.

Patent application 712,456. Photoparamp Array Multiplexer. Filed Aug. 6, 1976.

Patent application 714,436. Diver's Pulse Stretch Sonar. Filed Aug. 13, 1976.

Patent application 720,915. Signal Processing Devices Using Residue Class Arithmetic. Filed Sept. 7, 1976.

Patent application 742,448. Reticle-Lens System and Method. Filed Sept. 20, 1976.

Patent application 744,051. Canted Rotary Seal. Filed Nov. 22, 1976.

Patent 4,170,707. Method for Preparing 3,8-Dicarbomethoxy-2,3,7,8-Tetraazaspiro(4.4)nona-1,6-diene. Filed Aug. 28, 1978. Patented Oct. 9, 1979. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–079,913. Means for Controlling Aerodynamically Induced Twist. Filed Sept. 28, 1979.

Patent application 6–092,142. Aluminum Ion-Containing Polyimide Adhesives. Filed Nov. 7, 1979.

Patent application 6–096,257. Continuous Self-Locking Spiral Wound Seal. Filed Nov. 20, 1979.

Patent application 6–106,118. Antenna Feed System for Receiving Circular Polarization and Transmitting Linear Polarization. Filed Oct. 30, 1979.

Patent application 6–106,119. Faraday Rotation Measurement Method and Apparatus. Filed Dec. 21, 1979.

Patent application 6–106,188. Strong Thin Membrane Structure. Filed Dec. 21, 1979.

Patent 4,176,007. Method and Apparatus for Eliminating Luminol Interference Material. Filed Feb. 9, 1978. Patented Nov. 27, 1979. Not available NTIS.

Patent 4,176,662. Apparatus for Endoscopic Examination. Filed June 17, 1977. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,176,950. Laser Doppler Velocity Simulator. Filed July 28, 1978. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,177,325. Aluminum or Copper Substrate Panel for Selective Absorption of Solar Energy. Filed May 30, 1978. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,177,333. Catalysts for Polyimide Foams From Aromatic Isocyanates and Aromatic Dianhydrides. Filed Feb. 24, 1978. Patented Dec. 4, 1979. Not available NTIS.

Patent 4,180,648. Crystalline Polyimides. Filed May 15, 1978. Patented Dec. 25, 1979. Not available NTIS.

Patent 4,181,589. Method for Separating Biological Cells. Filed Mar. 6, 1979. Patented Jan. 1, 1980. Not available NTIS.

DEPARTMENT OF THE ARMY, OTJAG
Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 871,271. Helical Lock for Automatic Gun. Filed Jan. 23, 1978.

Patent 4,164,650. Means for Reducing Nuclear Radiation-Induced Fluorescence Noise in Fiber-Optics Communications Systems. Filed July 8, 1977. Patented Aug. 14, 1977. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
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	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
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Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

**Call only between the hours of 12 o'clock noon and 5 :00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 12, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-2-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	5-3-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-11-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-2-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measurir ; and Testing; Indicating; Fluent Material Handling.	12-20-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	8-8-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-2-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	5-21-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	6-7-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-7-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	3-19-79

Expiration of patents: The patents within the range of numbers indicated below expire during July 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,095,572 to 3,099,836, inclusive
Plant Patents ..... Numbers 2,269 to 2,270, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 5, 1980

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T997,001
GASOLINE DISPENSING APPARATUS

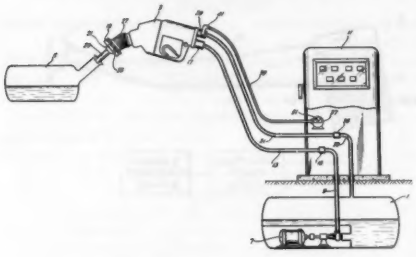
Michael J. Dougherty, 1850 N. Brea Blvd., #F-13, Fullerton, Calif. 92635

Continuation of Ser. No. 783,671, Apr. 1, 1977, abandoned. This application Jan. 18, 1979, Ser. No. 4,593

Int. Cl.[3] B65B *3/18*

U.S. Cl. 141—95

2 Sheets Drawing. 12 Pages Specification



A gasoline dispensing system having vapor removal means associated therewith incorporating a pressure-actuated switch for detecting increased gas pressure in said vapor removal means when a liquid blockage occurs therein. When the gas pressure exceeds a predetermined amount, said pressure switch energizes an electrical circuit comprising an alarm.

T997,002
MAGNETIC FLUID-FILTER ASSEMBLY

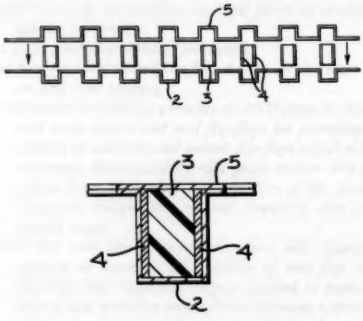
James F. Justice, 827 N. Rebecca Pl., Peoria, Ill. 61606

Continuation of Ser. No. 937,002, Aug. 25, 1978, abandoned. This application Jun. 29, 1979, Ser. No. 53,594

Int. Cl.[3] B01D *35/06*

U.S. Cl. 210—222

2 Sheets Drawing. 9 Pages Specification



A cleanable and reusable magnetic fluid-filter assembly (**1**) includes a plurality of elongate magnetic elements (**3**) hermetically sealed between two fluid-impervious sheets (**2,5**) in substantially parallel relation. The sheets (**2,5**) define relatively thin spacer portions having fluid-flow openings (**6**) between the magnetic elements (**3**) and integrally formed connector elements (**7**) at one end of the sheets (**2,5**) for releasably interlockingly engaging the openings (**6**) and maintaining a tubular configuration of the assembly (**1**).

T997,003
IDLE SYSTEM FUEL CONTROL FOR VARIABLE AREA VENTURI CARBURETOR

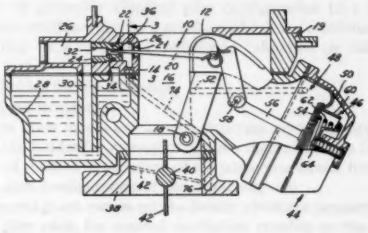
John Dirda, 25320 Shiawssee, Southfield, Mich. 48075

Continuation of Ser. No. 662,471, Mar. 1, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 770,162

Int. Cl.[2] F02M *9/06*

U.S. Cl. 261—41 D

2 Sheets Drawing. 14 Pages Specification



A variable area venturi carburetor has a movable venturi wall with a fuel metering rod attached for cooperation with a fuel jet located near an opening in the fixed venturi wall portion, a bypass passage connected to the connecting chamber between the fuel jet and the wall opening siphoning off the fuel at closed positions of the throttle valve to prevent stumbling of the engine by fuel flowing into the main venturi and clogging the small clearance space between the throttle valve and induction passage wall.

T997,004
ACYLHYDRAZINOPHENYLTHIOUREA NUCLEATING AGENTS AND PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING SUCH AGENTS

Ronald E. Leone, c/o Kodak Park Division, Rochester, N.Y. 14650

Division of Ser. No. 56,588, Jul. 11, 1979, abandoned. This application Dec. 19, 1979, Ser. No. 105,317

Int. Cl.[3] G03C *5/24;* **C07C** *121/60, 157/09;* **C07D** *207/24*

U.S. Cl. 430—378

No Drawing. 78 Pages Specification

Novel 3,3-disubstituted acylhydrazinophenylthiourea nucleating agents are disclosed as well as silver halide photographic emulsions and elements containing silver halide grains capable of forming an internal latent image having the nucleating agents adsorbed to the surface of the silver halide grains. Imaging processes in which these materials participate are also disclosed.

REISSUES

AUGUST 5, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,356

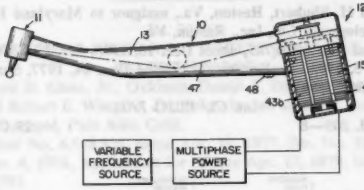
HAND DRILLING

Herbert Berman, 1018 Beacon St., and Harvey L. Pastan, c/o Herbert Berman, 1018 Beacon St., both of Brookline, Mass. 02146

Original No. 3,427,720, dated Feb. 18, 1969, Ser. No. 318,864, Oct. 25, 1963. Application for reissue Jun. 16, 1978, Ser. No. 915,912

Int. Cl.[2] A61C *11/06*

U.S. Cl. 433—131 **11 Claims**



1. Hand drilling apparatus comprising:

means defining a casing that can be held in one hand,

means secured to said casing for supporting a bit for high speed rotary motion,

an electric brushless motor having a rotor inductively coupled to a stator and supported by said casing for imparting rotary motion through means including the bit supporting means to a bit when supported by the latter,

a source of multi-phase electrical power of controllable frequency,

leads coupling said electrical power source to said electrical brushless motor,

and means for adjusting the frequency of said electrical power to control the speed of said rotary motion to a maximum in the range of 200,000 r.p.m.,

said source of multi-phase electrical power of controllable frequency comprising,

a pulse source of variable frequency,

at least first and second flip-flops having set and reset inputs and set and reset outputs,

and means including a plurality of AND gates for intercoupling said pulse source and said flip-flops for providing from like outputs of said first and second flip-flops signal waveforms of frequency determined by said pulse source with phase displaced from each other by a fraction of the period at said frequency independent of said frequency over a wide frequency range,

and first and second power amplifiers with respective inputs coupled to respective like outputs of said first and second flip-flops and respective outputs coupled to respective windings of said brushless motor for establishing a rotating field in said motor causing said rotor to rotate at a frequency related to that of said pulse source,

and said means for adjusting comprises means for adjusting the frequency of said pulse source.

Re. 30,357

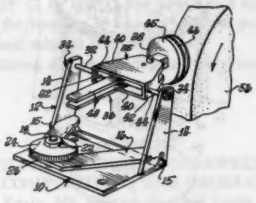
DEVICE FOR GRINDING A CABACHON

Henry L. Henry, Yucca Valley, Calif., assignor to Geode Industries, Inc., New London, Iowa

Original No. 4,010,575, dated Mar. 8, 1977, Ser. No. 578,924, May 19, 1975. Application for reissue Oct. 18, 1978, Ser. No. 952,571

Int. Cl.[2] B24B *11/00*

U.S. Cl. 51—229 **4 Claims**



1. In a device to facilitate the grinding of the face of a cabochon of generally elliptical plan configuration to a curved convex configuration by a grinding wheel, the combination of:

a dop stick to hold an unfinished cabochon on one of its ends;

a holder for the dop stick;

a base structure;

first pivot means on the base structure pivotally supporting the holder for manual oscillation thereof about a first axis of rotation in the plane of the transverse center line of the plan configuration of the cabochon; and

second pivot means on the holder pivotally supporting the dop stick for manual oscillation relative to the holder about a second axis of rotation in the plane of the longitudinal center line of the plan configuration of the cabochon;

the distance of the first pivot means from the desired convex face of the cabochon being substantially equal to the desired radius of longitudinal curvature of the convex face of the cabochon,

the second pivot means being located between the cabochon and the first pivot means,

the distance of the second pivot means from the desired convex face of the cabochon being substantially equal to the desired radius of transverse curvature of the convex face of the cabochon;

whereby, when said device is positioned for use and the face of an unfinished cabochon on said dop stick is brought into proper grinding contact with said grinding wheel, the holder and dop stick are simultaneously movable about the above-mentioned first and second axes of rotation so that said face can be smoothly ground to said curved convex configuration;

said base structure including a normally fixed base and a support carrying the first pivot means;

the support being pivotally mounted on the base and having a normal forward limit position;

said base structure also including means yieldingly urging the support towards its limit position and permitting retraction of the support from its limit position to avoid damage to the device in the event the rotary grinding wheel exerts a sudden thrust against the cabochon.

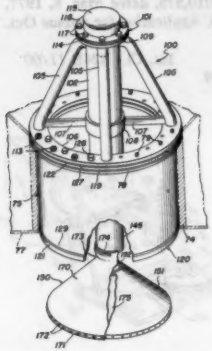
Re. 30,358
HOPPER VALVE MODULE FOR HOPPER DREDGE

Ezra Sensibar, Chicago, Ill., assignor to David Sensibar, Irrevocable Trust, Chicago, Ill.

Original No. 4,030,435, dated Jun. 21, 1977, Ser. No. 679,158, Apr. 22, 1976. Application for reissue Nov. 24, 1978, Ser. No. 963,466

Int. Cl.[2] B63B *35/30*

U.S. Cl. 114—36 44 Claims



1. In a hopper dredge vessel having a hopper with *side walls and* an outlet at the bottom thereof, a removable hopper valve module comprising housing means removably mountable on the associated hopper adjacent to the outlet thereof *with no portion of said housing extending laterally underneath any portion of the side walls of the associated hopper* a *single* valve member movable in use *substantially axially of the hopper outlet* between a closed position closing the hopper outlet and an open position opening the hopper outlet, and drive means carried substantially solely by said housing means and coupled to said valve member for effecting movement thereof between the open and closed positions thereof, said valve module being connected to the associated vessel only adjacent to the hopper outlet and adaptably mounted so as to be readily attached [and removed] as a unit [from] *to* the hopper *and removed as a unit from the hopper upwardly therethrough in either the open or closed position of said valve member.*

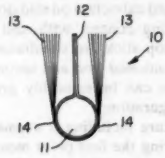
Re. 30,359
METHOD OF MAKING PILE WEATHERSTRIPPING

Jay C. Metzler, Pittsford, N.Y., assignor to Schlegel Corporation, Rochester, N.Y.

Original No. 4,024,004, dated May 17, 1977, Ser. No. 536,315, Dec. 26, 1974. Application for reissue May 15, 1979, Ser. No. 39,118

Int. Cl.[2] D02G *3/00*

U.S. Cl. 156—169 2 Claims



1. A pile weatherstripping method comprising:

a. forming a plurality of continuous lengths of a resin anchorage base each having a cross-sectional shape for providing an interference fit in a retainer slot;

b. advancing said bases in parallel relation;

c. wrapping a [multi-filament] *filament* yarn continuously around said bases as they advance to enclose said bases within loops of said yarn;

d. securing said yarn to the outside of said wrapped bases along opposite sides of each of said bases;

e. slitting said yarn to separate said plurality of said wrapped bases and to provide each of said bases with a pair of insulating pile rows extending generally tangentially outward in the same general direction from each of said opposite sides of said bases; and

f. using said bases to anchor said weatherstrip in said retainer slot and press said pile rows against opposite sides of said retainer slot so said pair of pile rows extends outward from said retainer slot.

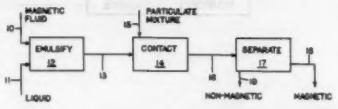
Re. 30,360
MAGNETIC SEPARATION OF PARTICULATE MIXTURES

Roland H. Shubert, Reston, Va., assignor to Maryland Patent Development Co., Inc., Reston, Va.

Original No. 3,926,789, dated Dec. 16, 1975, Ser. No. 376,335, Jul. 5, 1973. Application for reissue Dec. 14, 1977, Ser. No. 860,567

Int. Cl.[2] B03O *1/00*

U.S. Cl. 209—8 29 Claims



1. A method of recovering a mineral from the gangue constituents of its ore which comprises:

comminuting the ore to a size range whereat there is achieved substantial physical liberation of the mineral from the gangue constituents of the ore;

rendering the surfaces of the mineral particles magnetic by selectively wetting the surfaces of said mineral particles with a magnetic fluid, said magnetic fluid comprising an ultra-stable colloidal suspension of magnetic particles in a liquid carrier, said liquid carrier being selected from the group consisting of hydrocarbons, fluorocarbons, silicone oils, water and esters, said magnetic fluid being capable of reacting with an external magnetic field and displaying the behavior of a homogeneous Newtonian liquid, and

subjecting the comminuted ore to a magnetic separation whereby a magnetic concentrate comprising magnetic fluid-wetted mineral particles is recovered.

Re. 30,361
HERBICIDAL 4-TRIFLUOROMETHYL-4-NITRODIPHENYL ETHERS

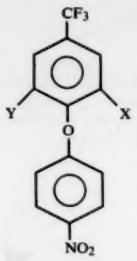
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Original No. 4,076,741, dated Feb. 28, 1978, Ser. No. 331,947, Feb. 12, 1973. Continuation-in-part of Ser. No. 234,656, Mar. 14, 1972, Pat. No. 3,888,932. Application for reissue Mar. 9, 1979, Ser. No. 18,965

Int. Cl.[2] C07C *121/75, 43/20*

U.S. Cl. 260—465 F 6 Claims

1. A compound of the formula



wherein X is a [hydrogen atom,] a trifluoromethyl group, a (C_1–C_4) alkyl group, or a cyano group, and

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group[, provided that when X is a hydrogen atom, Y is other than a halogen atom].

Re. 30,362

PROCESS FOR PREPARING POLYVINYLAMINE AND SALTS THEREOF

Richard D. Gless, Jr., Oakland; Daniel J. Dawson, Los Altos, and Robert E. Wingard, Jr., Palo Alto, all of Calif., assignors to Dynapol, Palo Alto, Calif.

Original No. 4,018,826, dated Apr. 19, 1977, Ser. No. 520,530, Nov. 4, 1974. Application for reissue Apr. 17, 1979, Ser. No. 30,781

Int. Cl.[2] **A23L** *1/27;* **C07C** *87/24;* **C08F** *120/52, 126/02*

U.S. Cl. 525—355 **6 Claims**

1. A process for preparing poly(vinylamine) salt which comprises the steps of:

A. reacting at a temperature of from 20° C. to 100° C. acetaldehyde with from two to four stoichiometric equivalents of acetamide in the presence of from 0.001 to 1.0 mole per mole of acetamide of an aqueous mineral acid catalyst to yield a vinylacetamide and ethylidene-bis-acetamide containing reaction product,

B. neutralizing the aqueous mineral acid catalyst and heating the vinylacetamide and ethylidene-bis-acetamide containing reaction product to 150° C. to 250° C. for from 0.2 to 5 hours in the presence of an inorganic nonacidic silicious oxide surface catalyst to yield a decomposition product, said catalyst having a surface area of at least about 1 m^2/g,

C. separating vinylacetamide from said decomposition product by vacuum volatilization,

D. contacting with vinylacetamide at a concentration of from 10% to 50% by weight in a reaction medium selected from polar hydrogen bonding liquids and nonpolar liquids with from 0.1 to 20 grams per 100 grams of vinylacetamide of a free radical initiator polymerization catalyst at a temperature of from 25° C. to 125° C. for from 4 to 8 hours to yield poly(vinylacetamide),

E. hydrolyzing said poly(vinylacetamide) by contacting it with from 1.05 to 3 equivalents of a mineral acid per equivalent of poly(vinylacetamide) at a temperature of from [25° C. to 125° C. for from 4 to 8 hours] *60° C. to 175° C. for from 1 to 36 hours* to yield the poly(vinylamine) salt of said mineral acid, and

F. precipitating and recovering said poly(vinylamine) salt.

Re. 30,363

PROCESSES FOR PRODUCING STRAWBERRY FLAVOR COMPOSITIONS AND PRODUCTS

Philip deC. Kratz, Mt. Gretna, Pa., and Louis J. Strasburger, Elizabeth, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Original No. 3,499,769, dated Mar. 10, 1970, Ser. No. 579,228, Sep. 14, 1966. Application for reissue May 5, 1976, Ser. No. 683,353

Int. Cl.[2] **A23L** *1/235*

U.S. Cl. 426—534 **6 Claims**

9. A process for preparing a food composition which comprises adding to a food a strawberry flavor concentrate consisting essentially of (1) at least one strawberry flavoring material selected from the group of lower alkyl esters, naphthyl lower alkyl ethers, vanillin, terpene alcohols, lower alkyl ketones and aromatic organic acids and (2) an amount of substantially pure 2-methyl-2-pentenoic acid sufficient to impart a fresh strawberry character to the composition.

PATENTS

GRANTED AUG. 5, 1980

ERRATA

For CLASS	See PATENT NO.
028–204	4,215,455
433–080	4,215,476
433–136	4,215,477
433–025	4,215,478
368–010	4,215,531
368–168	4,215,532
474–062	4,215,589
474–205	4,215,590
430–207	4,216,018
430–308	4,216,019
568–364	4,216,172
371–027	4,216,374
280–408	4,216,382
455–028	4,216,426
455–119	4,216,427
455–148	4,216,429
455–219	4,216,430
455–333	4,216,431
455–079	4,216,432
371–057	4,216,460

PATENTS

GRANTED AUG. 5, 1980

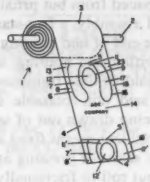
ERRATA

PATENTS

GRANTED AUGUST 5, 1980

GENERAL AND MECHANICAL

4,215,432
ROLL OF DISPOSABLE APRONS
Dennis B. Smith, 2312 Galen Dr., Champaign, Ill. 61820
Filed Oct. 24, 1978, Ser. No. 954,091
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—48 **16 Claims**

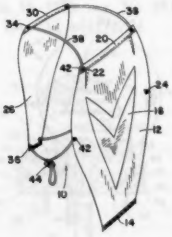


1. A roll of plastic film aprons comprising an elongated strip of unfolded, flattened plastic film wound on a core support, said unfolded film having a plurality of perforations extending transversely thereof at predetermined spaced intervals to enable tearing discrete sheets of plastic film from the roll, said plastic film having, intermediate each pair of successive transverse perforations,

(a) adjacent to and spaced from the upper of said pair of perforations, a central cutout and removed portion defining a neck hole of an apron, and

(b) a pair of longitudinally extending cutout and removed portions, said longitudinal cutouts being located on opposite sides of said neck hole cutout and adjacent to and spaced from an edge of said film, said longitudinal cutouts beginning at the upper of said pair of perforations and terminating intermediate said pair of perforations to define an apron having torso-engaging tie straps when an individual sheet of plastic film is torn from said roll.

4,215,433
BURGEE APRON
Martha C. Pfohl, P.O. Box 624, San Rafael, Calif. 94901
Filed Aug. 17, 1979, Ser. No. 67,326
Int. Cl.[2] A41B *13/00*
U.S. Cl. 2—48 **6 Claims**



1. An apron comprising:

a large panel with a small panel each of truncated, generally triangular configuration and of flexible sheet material;

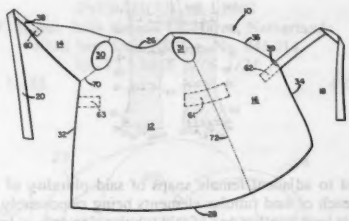
said large panel being inverted with the triangle base uppermost to form the bib of an apron;

first and second pairs of openings in said large panel along the sides thereof, said first pair being disposed at the top thereof and said second pair being disposed intermediate the top and bottom thereof;

third and fourth pairs of openings in said small panel along the sides thereof adjacent to the top and bottom thereof, respectively; and

cords interconnecting said first pair of openings with one of said third and fourth pairs, and cords connecting said second pair of openings with the other of said thrid and fourth pairs.

4,215,434
PATIENT'S HOSPITAL GOWN
Jeanette W. Barron, 53 Beatrice Cir., Belmont, Mass. 02178
Filed Mar. 7, 1979, Ser. No. 18,465
Int. Cl.[2] A41B *9/00*
U.S. Cl. 2—114 **11 Claims**



1. A one-piece patient's hospital gown comprising:

a torso portion contoured to be wrapped around the front or back of a patient and to conformally fit around the patient's neck, said torso portion having two spaced openings each adapted for placement of a respective patient's arm therethrough, and an edge disposed substantially longitudinally with respect to said patient;

a first flap extending from said torso portion and having a body portion adapted to be draped across the other of said front or back of a patient than said torso portion, and a neck portion adapted to be placed adjacent to the neck of a patient, said first flap having a width which increases from said neck portion to said body portion;

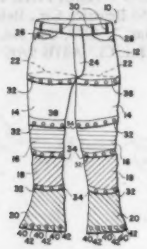
a second flap extending from said torso portion oppositely from said first flap and at the upper end of said edge and adapted to be draped across the front or back of a patient in overlapping relationship with the neck portion of said first flap; and

means for securing the ends of said first and second flaps to maintain substantial coverage of underlying portions of the patient's body.

4,215,435
CONVERTIBLE TROUSERS
Joseph Miele, 204 Port Royal Dr., H.C.B., Toms River, N.J. 08753
Continuation of Ser. No. 763,414, Jan. 28, 1977, abandoned. This application Jun. 5, 1978, Ser. No. 912,754
Int. Cl.[2] A41D *1/06*
U.S. Cl. 2—227 **6 Claims**

1. Convertible trousers comprising a body portion configured to accommodate therein the lower half of a human torso, said body portion providing a pair of apertures to accommodate a pair of human legs disposed therethrough, a pair of leg portions for accommodating therein said pair of human legs, said leg portions each comprising a plurality of flexible interchangeable tubular elements each having an uppermost edge and a lowermost edge, and means for selectively removably securing each of said uppermost edges to a lowermost edge of one of said tubular elements including a plurality of male snaps and a plurality of cooperating female snaps, said plurality of

male snaps being fixedly secured adjacent to the lowermost edges of each of said plurality of tubular elements and to said body portion adjacent said apertures thereof, said plurality of female snaps being fixedly secured adjacent to the uppermost edges of each of said plurality of tubular elements, said plurality of male snaps and said plurality of female snaps being disposed in uniform spaced apart relationship and being disposed removably engaged to one another, a portion of each of said plurality of male snaps being located on an exterior surface of said tubular elements, whereby said portion of said each of said plurality of male snaps is visually accessible when the remaining portion of said each of said plurality of male snaps are



engaged to adjacent female snaps of said plurality of female snaps, each of said tubular elements being removeably securable to at least another one of said tubular elements, at least one of said plurality of tubular elements being affixable to said body portion adjacent said apertures located therein, several of said tubular elements being distinctive in visual appearance, one of said each of said tubular elements having another plurality of female snaps secured adjacent the lowermost edge thereof, whereby said lowermost edge and said uppermost edge of said one of said each of said tubular elements may be selectively secured to said lowermost edge of said another one of said tubular elements.

4,215,436

HEADWEAR MOUNTED TRANSPARENT FILM DISTRIBUTING MEANS

Jack L. Ketterer, 525 Oak Ave. East, St. Michael, Minn. 55376

Filed Jun. 14, 1979, Ser. No. 48,614
Int. Cl.[2] A42B *1/06*
U.S. Cl. 2—422 **6 Claims**

1. In a face and head protective hood assembly having a window plate for vision, a movable flexible transparent film as a replaceable protector over the outer surface of said window plate, payout means for said film, and take-up means for removing soiled film contaminated with vision obstruction material from the area of said window plate, said payout means and said take-up means being mounted on opposite sides of said window plate, the improvements wherein,

(i) said payout means consists essentially of an elongated housing attached on the exterior of said hood assembly along one edge of said window plate, a straight longitudinally extending narrow slot in said housing, said slot being faced toward and spaced from but proximate to the outer surface of said hood assembly, a free-standing non-rotatable shaft fixed to one end of said housing and substantially centrally oriented within said housing, a replaceable hollow payout roll of said flexible transparent film mounted for rotation about said non-rotatable shaft within said housing, said film being drawn out of said slot over said window plate, and resilient means fixed along the exterior of said non-rotatable shaft for pressing against the hollow interior of said payout roll to frictionally resist rotational movement of said payout roll about said non-rotatable shaft, and

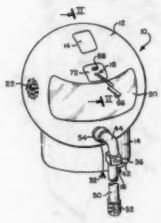
(ii) said take-up means consists essentially of a take-up shaft free of an external housing, a hand operated knurled wheel fixed on said take-up shaft proximate to one end thereof, bracket means on the interior of said hood assembly for removably mounting the ends of said take-up shaft to permit rotational movement thereof by turning said knurled wheel, said knurled wheel being at a location between said mounted ends of said take-up shaft, and a leaf spring fixed on said hood assembly in biased relationship against said knurled wheel to prevent backwind of said wheel and said take-up shaft but allow rotational movement thereof in one direction only, whereby said take-up means functions in cooperation with said resilient means of said payout means as the sole structural elements for maintaining said transparent film in taut condition over the outer surface of said window plate, said take-up means being operable without binding even when vision obstruction material on said transparent film is several times the thickness of said transparent film.

4,215,437

HELMET-MASK FOR COLD WEATHER AND/OR PARTICULATE LADEN ENVIRONMENTS

Ti Kao, 61-14 Austin St., Rego Park, N.Y. 11374

Filed May 30, 1979, Ser. No. 43,957
Int. Cl.[2] A42B *3/00*; A62B *18/02*
U.S. Cl. 2—424 **3 Claims**



1. A face mask comprising a head covering to substantially cover the head of the wearer, said head covering having a transparent window, sealing means secured to said head covering for isolating the inside of said head covering from the atmosphere when said head covering is worn, a hollow joint member having upper and lower ends and an opening at a side section thereof, outer conduit means, one end being rotatably secured to a front lower portion of said head covering and the other end being secured to said upper end of said joint member, inner conduit means connected at one end to said opening of

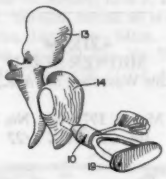
said joint member and extending within said outer conduit up to said front lower portion of said head covering, a flexible conduit means secured at one end to said lower end of said joint member and having a free end to which filter means is connected, first valve means operatively situated in said joint member so that when air is inhaled into said head covering, only said first valve means opens, second valve means operatively situated at a free end of said inner conduit means so that when air is exhaled to the atmosphere, only said second valve means opens, and wiper means secured at a front upper portion of said head covering.

4,215,438

PROSTHESIS FOR OSSICULAR CHAIN RECONSTRUCTION

Dennis G. Pappas, 2940 Clairmont Ave., Birmingham, Ala. 35205

Filed Jan. 22, 1979, Ser. No. 5,215
Int. Cl.³ A61F *1/24, 1/00*
U.S. Cl. 3—1.9 **1 Claim**



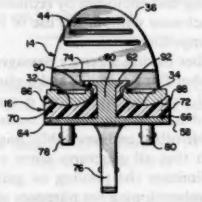
1. In a prosthesis for reconstruction of the auditory ossicles,
(a) a member of substantially rigid material having an open cup-like end and an integrally formed stem projecting axially from the closed end of the cup-like portion, said prothesis being approximately 0.098 inches in overall length, the cup-like portion having an outside diameter of approximately 0.054 and an inside diameter of approximately 0.047 inch, the cup-like portion being generally cylindrical shaped and about 0.034 inch long, said stem being approximately 0.016 inch in diameter and about 0.045 inch long, and
(b) a conical section joining the cup and stem portions and being on the order of 0.019 inch long.

4,215,439

SEMI-RESTRAINING KNEE PROSTHESIS

Barry L. Gold, Warsaw, and Richard C. Bolesky, Rolling Hills, both of Ind., assignors to Zimmer, USA, Warsaw, Ind.

Filed Oct. 16, 1978, Ser. No. 951,860
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 **3 Claims**



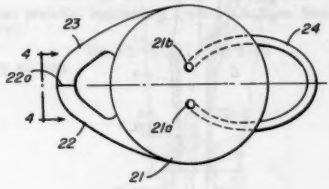
1. A surface-replacement knee joint prosthesis comprising: a tibial component including medial and lateral articulate surface means of concave configuration, and bridge means rigidly mechanically interconnecting said surface means; a surface-replacement femoral component including medial and lateral articular surface means of convex configuration congruent with said concave tibial surface means for matably bearing engagement respectively with said medial and lateral tibial surface means, and bridge means rigidly mechanically interconnecting said femoral articular surface means; and restraining means acting between said femoral and tibial components for preventing superior-inferior and lateral-medial dislocation of said components and for defining limited superior-inferior motile freedom during flexion of the knee joint and for incurring progressively more intimate mating engagement of said femoral and tibial articular surfaces as said knee joint rotates from flexion into extension, including a stem portion having a shank of triangular cross-section and a truncated head and including a cooperating pair of opposed claw arms defining a posteriorly divergent, tapered slot therebetween for progressively receiving said shank in the lateral-medial plane as full extension is approached, said claw arms defining wedge-shaped formations for use in incurring said progressive engagement and said motile freedom.

4,215,440

INTRAOCULAR LENS

Jan G. F. Worst, Julia Nalaan 11, Haren, Netherlands

Filed Sep. 25, 1978, Ser. No. 945,314
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **4 Claims**



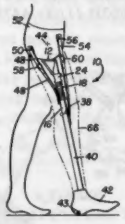
1. An iris fixation intraocular lens comprising an optical portion having a support portion on each side adapted to attach to eye tissue, at least one said side support portion comprising a pair of flat, flexible, normally abutting pincer-like arms adapted to pinch and fixate a portion of one surface only of iris tissue without penetrating to said other surface.

4,215,441

PROSTHETIC HIP

Michael T. Wilson, Concord, Calif., assignor to Thomas Haslam, Houston, Tex., a part interest

Filed Feb. 12, 1979, Ser. No. 11,127
Int. Cl.² A61F *1/08, 1/04*
U.S. Cl. 3—15 **15 Claims**



1. A flexion biased prosthesis comprising:
an upper limb pylon;
a bearing plate adapted for mounting on a hip socket;
said bearing plate pivotally affixed to the superior end of said upper limb pylon;
flexor means for flexing said upper limb pylon relative said bearing plate whereby with said bearing plate fixed to a

hip socket said upper limb pylon is flexed forwardly of the frontal plane.

4,215,442

MULTI-BAR LINKAGE KNEE WITH FIXED ROTATION AXIS

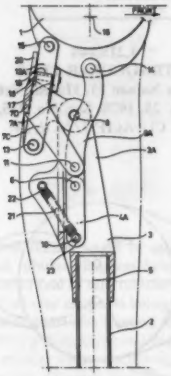
Brian G. Blatchford, Basingstoke, and Victor J. Woolnough, Kempshott, Nr. Basingstoke, both of England, assignors to Chas. A. Blatchford & Sons Limited, Basingstoke, England

Filed Sep. 27, 1978, Ser. No. 946,371

Claims priority, application United Kingdom, Sep. 28, 1977, 40343/77

Int. Cl.[3] **A61F** *1/04, 1/08*

U.S. Cl. 3—22 **13 Claims**



1. An artificial leg comprising:

an upper leg component to be fitted to the patient's stump;

a lower leg component including a shin member portion; and

a knee mechanism connecting the upper leg component to the lower leg component to allow rotation of one component relative to the other;

the knee mechanism being in the form of a multi-bar linkage defining a knee axis of rotation which is essentially stationary relative to the lower leg component over the complete range of knee flexion; and

the said mechanism being located below said axis of rotation.

4,215,443

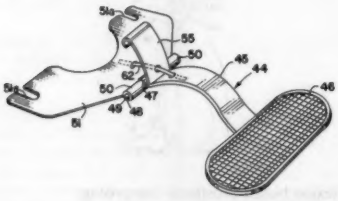
TOILET ANTI-SPLASH AND SILENCER DEVICE

Peter P. Babik, 4142 Reicosky La. NW., Canton, Ohio 44718

Continuation-in-part of Ser. No. 895,750, Apr. 13, 1978, abandoned. This application Mar. 26, 1979, Ser. No. 23,642

Int. Cl.[2] **E03D** *11/00;* **A47K** *17/00*

U.S. Cl. 4—300.3 **6 Claims**



1. A toilet anti-splash and silencer device for use on a flush toilet including an assembly of a bowl with an upper rim and a seat hingedly mounted on seat hinge brackets attached adjacent the rim at the rear of the bowl comprising:

(A) means attaching the silencer device to the bowl and seat assembly at the seat hinge brackets for pivotal movement about an axis adjacent the upper rim at the rear of the bowl, said means comprising a thin flat member which is clamped under the seat hinge brackets when the device is in the assembled position on the toilet;

(B) an arm member pivotally attached to and extending from the attaching means into the interior of the bowl;

(C) a perforate baffle means fixedly attached to the end of the arm member which is extended into the bowl, at a location spaced from the interior wall of the bowl; and

(D) a seat contacting means fixedly attached to the arm member at the end opposite the baffle means;

(E) said seat contacting means adapted to co-operate with the seat in such manner that when the seat is lowered, the seat bears downwardly against the seat contacting means, and moves the arm and baffle means to a retracted position at the rear of the bowl and when the seat is raised, it breaks contact with the seat contacting means, thereby permitting the arm and baffle means to move to an extended position toward the center of the bowl.

4,215,444

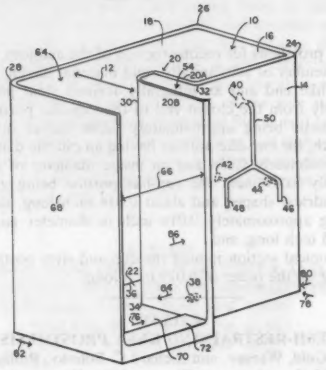
SHOWER STALL

William T. Brown, 206 Westwood 5th Ave., McMinnville, Tenn. 37110

Filed May 2, 1979, Ser. No. 35,241

Int. Cl.[3] **A47K** *3/22*

U.S. Cl. 4—612 **7 Claims**



1. A shower enclosure for reducing or eliminating mold and odors by reducing or eliminating pooling locations, and for reducing water damage to structures, rugs, floors, walls and the like surrounding said enclosure by reducing water splashed outside of said enclosure without the use of curtains or doors, said enclosure comprising:

a shower chamber having an entry passage, and including a shower chamber floor member and a plurality of substantially vertical walls which enclose a space defining said shower chamber, said plurality of walls being smoothly joined to each other and smoothly joined to said floor member such that all junctures form curved or coved corners to eliminate the pooling or gathering of water, said floor member sloping for purposes of directing water to a drain aperture defined by said floor member, and a portion of said enclosing walls defining said entry passage, the edges of said entry passage being curved and smooth to reduce the pooling or gathering of water; and

an antechamber having a primary entry way and being smoothly connected to said shower chamber by said entry passage, said antechamber including an antechamber floor member and a plurality of substantially vertical walls which enclose a space defining said antechamber, said

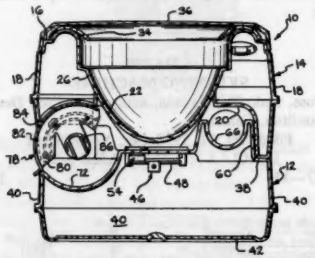
plurality of walls being smoothly joined to each other and smoothly joined to said antechamber floor member such that all junctures form curved or coved corners to eliminate the pooling or gathering of water, said enclosing walls defining said entry passage and said primary entry way and said primary entry way being positioned at a selected location in said enclosing walls with respect to said entry passage such that water splashed out of said shower chamber through said entry passage cannot continue unobstructed through said primary entry passage and out of said antechamber, and said antechamber floor member being smoothly joined with said shower chamber floor member at said entry passage and sloping such that water falling on said antechamber floor member runs out of said antechamber through said entry passage onto said shower chamber floor member and then to said drain aperture.

4,215,445

PORTABLE TOILETS

John M. Antos; Arthur W. Henke; Erin J. Lindsay, all of Ann Arbor, and James T. Embach, Saline, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Sep. 14, 1979, Ser. No. 75,795
Int. Cl.[3] E03D *1/00*; A47K *11/02*; A61L *11/00*
U.S. Cl. 4—323 **11 Claims**



1. A portable toilet comprising a portable lower holding tank section and a portable upper seat section removably supported thereon, said seat section having walls that define a flush water storage tank and a toilet bowl with an outlet port at its bottom, and means for discharging flush water from the storage tank into the toilet bowl, said holding tank section having walls that define a closed receptacle with an inlet port in its top wall in registry with said outlet port, and said holding tank section having a valve assembly for opening and closing said inlet port, characterized in that said holding tank and seat sections define between them at least one storage chamber for storage of a material to be used in conjunction with the portable toilet and to be deposited in said holding tank.

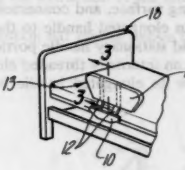
4,215,446

PADDED HOSPITAL BED SIDERAIL COVER

Patsie Mahoney, 1641 W. Territorial Rd., Battle Creek, Mich. 49015

Filed Aug. 28, 1978, Ser. No. 937,127
Int. Cl.[2] A47C *7/42*
U.S. Cl. 5—425 **2 Claims**

1. A removable padded cover for a hospital bed rail of the type having a symmetrical upper frame with substantially parallel top and bottom edges, and opposed side edges, comprising two substantially equal sized panels of padded material, each panel being substantially identical in shape to the periphery of said upper frame and having a slightly larger area than said upper frame, a flexible seam joining said panels together along the top pair and one adjacent side pair of matching peripheral edges of said panels, and detachable fastening means located along the outer borders of the bottom and remaining side matching pair of peripheral edges of said panels, for fastening said panels together and enclosing and covering substantially the entire upper frame when said pair of hinged panels is fitted over either end of said upper frame.

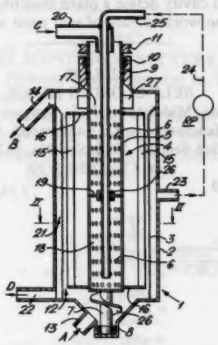


4,215,447

PROCESS AND APPARATUS FOR WASHING FIBRE STOCK IN THE DE-INKING OF PAPER

William T. Gartland, deceased, late of Hollingbourne, England, and by Jean G. Gartland, executor, Pine Cottage, Ashford Rd., Woodcut Hill, Hollingbourne, near Maidstone, Kent, England

Filed Sep. 26, 1978, Ser. No. 945,865
Claims priority, application United Kingdom, Sep. 28, 1977, 40366/77
Int. Cl.[2] D21C *1/02, 5/02*
U.S. Cl. 8—156 **12 Claims**



1. A process for washing high consistency fibre stock in the de-inking of paper, wherein the stock is passed along a passage from a stock inlet to a stock outlet, at least a portion of the passage being defined by a filter screen, and a longitudinally extending stirring member being disposed in the passage; washing liquid is introduced into the passage at least in a region remote from the stock inlet, effluent liquid passing through the filter screen; and relative rotary motion is effected between the filter screen and stirring member such that stock fibres roll around the passage in clusters as they pass therealong towards the stock outlet.

4,215,448

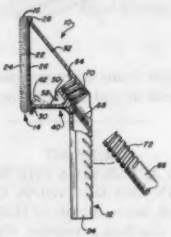
PAINT APPLYING TOOL

Fredrick B. Burns, South Milwaukee, and Richard J. Shaw, Brookfield, both of Wis., assignors to E Z Paintr Corporation, Milwaukee, Wis.

Filed Mar. 23, 1978, Ser. No. 889,241
Int. Cl.[2] A46B *5/02*
U.S. Cl. 15—210 R **7 Claims**

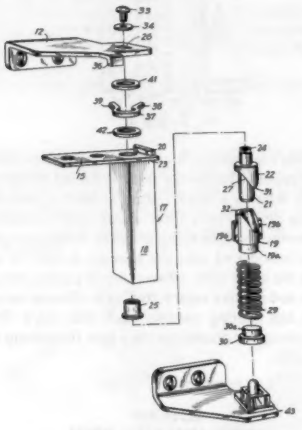
1. A paint applying tool comprising a base with forward, rear and opposite sides which define an elongated pyramid, an

applicating pad connected to the base, and means secured to said base at the apex of said pyramid for manual gripping by the user, said manual gripping means including a relatively short stationary handle portion having a longitudinal axis and an external gripping surface, and connector means for releasably connecting an elongated handle to the base at an angle with respect to said stationary handle portion, said connector means comprising an internally threaded element on said base adapted to receive an elongated handle having an external



thread on the end thereof wherein said internally threaded element comprises a cylindrical cavity having a longitudinal axis, said cavity being formed integrally with the base such that the axis of said cylindrical cavity forms an acute angle with respect to the axis of the stationary handle portion, said stationary handle portion being a hollow elongated tubular section secured to said base such that the axis thereof and the axis of said cylindrical cavity define a plane bisecting said base which is normal to the work surface of said paint applicating pad.

4,215,449
SELF-CLOSING HINGE
Frank F. Loikitz, Middletown, N.J., assignor to Standard Keil Hardware Manufacturing Co., Allenwood, N.J.
Filed Sep. 15, 1978, Ser. No. 942,849
Int. Cl.[2] E05F *3/20*
U.S. Cl. 16—50 **13 Claims**



1. A non-rising, reversible-hinge in cartridge form, comprising:

an elongated housing shaped for fitting vertically into a socket in the top or bottom edge of a door, said housing when positioned for mounting in said top edge having an upper end and a lower end, and vertical slot means in the interior thereof;

top flange means rigidly affixed to said housing for anchoring said housing to said top edge of said door and thereby assuring that said housing will rotate with said door;

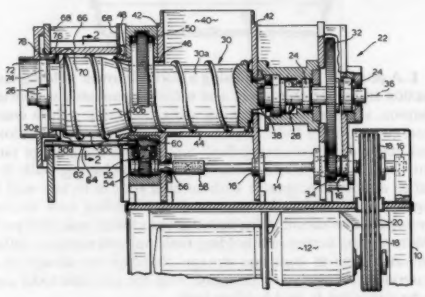
pin means within the upper portion of said housing and extending sufficiently above said housing to engage a support bracket, said housing and said flange means being arranged and constructed for permitting said pin means to protrude through said upper end and for permitting revolution of said housing relative to said pin means; said pin means having an upper end arranged and constructed for keying into said support bracket for preventing rotation of said pin means when said door is open;

a male cam member rigidly affixed to said pin means and having a lower cam surface;

a female cam member having an upper cam surface for engaging with said lower cam surface, a vertical, generally cylindrical exterior surface, and projection means on said exterior surface for engaging said vertical slot in said housing, thereby providing for rotation of said female cam member with said housing and for rotation of said female cam member relative to said male cam member; and

coil spring means disposed between said female cam member and said lower end for biasing said female cam member upwardly against said male cam member, said cam surfaces being shaped for forcing said cam members apart against the urging of said coil spring means when said door is opened and for converting the upward force of said spring means into a torque directed for closing said door, said coil spring means being free of pin means within same.

4,215,450
SKINNING MACHINE
Werner Poss, Oakville, Canada, assignor to Poss Design Limited, Hamilton, Canada
Filed Oct. 31, 1978, Ser. No. 956,248
Int. Cl.[2] A22C *21/00*; A22B *5/16*
U.S. Cl. 17—11 **13 Claims**



1. A skinning machine for removing skin from poultry pieces fed thereto comprising:

a frame providing a feed passage having a cylindrical radially outer passage wall;

a cylindrical feed screw mounted in the passage by the frame for rotation about a respective longitudinal axis and forming between itself and the said passage wall an annular feed passage having an entrance thereto for pieces to be de-skinned, an exit therefrom for the de-skinned pieces and another exit therefrom at a skin removal station for removed skin;

means for rotating the feed screw about the said longitudinal axis thereof;

skin removal means comprising a plurality of skin gripping means mounted by the frame around the circumference of the feed screw at the skin removal station to grip skin on the pieces moving in the passage and strip it therefrom so that it can pass through the said another exit therefor;

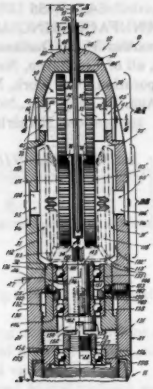
and a cylindrical barrier member mounted by the frame at the outlet from the skin removal station, the said barrier member engaging the pieces moving toward the deskinned piece exit and pressing them into engagement with the skin removal means.

4,215,451

DEHIDER

Mark W. Wikoff, Montgomery, Ohio, assignor to Best & Donovan, Cincinnati, Ohio

Filed May 10, 1979, Ser. No. 38,008
Int. Cl.³ A22B *5/16*
U.S. Cl. 17—21 **23 Claims**



1. A flaying tool having two blades in contact with one another, said blades being movable relative one to the other on a common blade axis, said tool comprising

a first housing and a second housing

a first blade gear shaft and a second blade gear shaft, one of said blades being mounted on said first shaft and the other of said blades being mounted on said second shaft, said first shaft being fixed to said first housing and said second shaft being fixed to said second housing,

first bearings between said blade and said first shaft and second bearings between said second blade and said second shaft, and

a grease system for at least one of said shafts, said system comprising a bore in said shaft, the exterior end of said bore being connectable with a grease injecting apparatus exterior of said housing, and the inner end of said bore being connected to said bearings and an interior cavity defined between two blades so that grease injected into said shaft's bore supplies grease for said bearings and for said interior cavity.

4,215,452

DEVICE FOR NOBBING AND GUTTING FISH

Karl-Heinz Nagrotzki, Lübeck, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG, Lübeck, Fed. Rep. of Germany

Filed Dec. 6, 1978, Ser. No. 966,813
Int. Cl.³ A22C *25/14*
U.S. Cl. 17—60 **4 Claims**

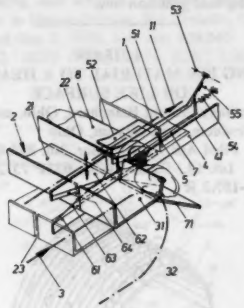
1. A device for nobbing and gutting fish, comprising

(a) an endless conveyor carrying fish troughs to receive fish lying on their sides,

(b) cutting tools arranged adjacent the ends of said troughs carrying the head of the fish and adapted to cut into the fish from both sides of their backbones closely behind their collar bones, and

(c) means for retaining the rumps of the fish by their severed edges where the head has been cut off and arranged downstream of said cutting tools when seen in the conveying direction of said troughs, said retention means being adapted to dip into the plane of said cuts to retain the fish bodies during the extraction of the entrails, and comprising

(d) a lower retention bar raising above the bottoms of said troughs and



(e) an upper retention face spaced above said retention bar and forming a gap therebetween, said upper retention face lying in a common plane with said retention bar,

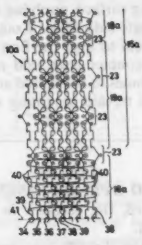
(f) at least said retention face being arranged to yield against force in said common plane.

4,215,453

NET JOINTING STRUCTURE

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 796,840, May 13, 1977, abandoned. This application Sep. 5, 1978, Ser. No. 939,666
Claims priority, application Japan, May 18, 1976, 51-57041
Int. Cl.² A44B *19/00*
U.S. Cl. 24—205.16 C **1 Claim**



1. A net jointing structure for jointing net ends together along a given junction line, comprising: a pair of adapters of warp-knitted net structure each having a net region and a web region, said net region being subdivided into a plurality of net sections one of which is smaller in mesh size than another and formed of a plurality of meshes made of warp chains, extending along respective lines generally diagonal to said junction line, said one net section being integral with said web region, said another net section of a larger mesh size being connectable to one of the net ends, said web region including a plurality of warp chains extending generally perpendicular to said junction line and spaced from each other along the length of the web region, said warp chains in the web region forming wales of warp chains and being extensions of said warp chains in said net section, said web region further including inlaid yarns each extending over a plurality of wales, each of said warp chains

having alternate loops interlaced jointly by a selected pair of said inlaid yarns which extend in opposite directions symmetrically with respect to said each of said warp chains, whereby said warp chains in the web region are kept by said inlaid yarns in uniformly spaced-apart relation to each other, and said inlaid yarn extending into and along said warp chains in the net region; and a sliding clasp fastener having a pair of stringers fixed to said web regions for coupling and uncoupling said adapters along said junction line.

4,215,454

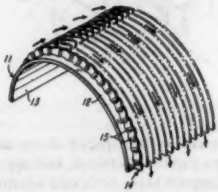
ATTACHING FIN MATERIAL TO A HEAT TRANSFER OR LIKE SURFACE

Robert E. Anthony, Mount Blanchard, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Apr. 7, 1978, Ser. No. 894,403

Int. Cl.[2] B21D *53/04*; B23P *15/26*

U.S. Cl. 29—157.3 R **13 Claims**



1. A method of producing extended surface fin-like material and attaching it to a heat transfer or like surface to project substantially perpendicularly thereof, including the steps of providing a planar strip of a material capable of assuming and maintaining bent configurations, deforming said strip including a step giving the strip an undulating configuration, formed undulations orienting in a sense generally perpendicular to a side edge of the strip and having sides that are in a convergent-divergent relation to one another, applying said strip to a heat transfer or like mounting surface so that said side edge thereof seats to said mounting surface, holding said strip in an applied position in which it stands on edge on said mounting surface with said undulations therein projecting substantially vertically of said mounting surface, applying a substantially uniform pressure to an opposite side edge of said strip, simultaneously over the length thereof to urge the first said side edge thereof into close intimate contact with said mounting surface, and while said strip continues to be so held and so pressured, metallurgically bonding it to said mounting surface along the first said side edge.

4,215,455

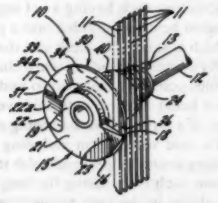
REED OPENER ASSEMBLY

Dhiru Patel, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 2, 1979, Ser. No. 25,704

Int. Cl.[2] D03J *1/14*

U.S. Cl. 28—204 **13 Claims**



1. A reed opener assembly for use in a warp drawing-in machine having means for providing relative longitudinal movement of the reed opener assembly with respect to a reed supported in the machine and means for selectively rotating the reed opener assembly, said reed opener assembly having a cam surface for successively engaging the dents of a reed so as to spread adjacent dents in response to rotation of said reed opener assembly, and comprising: a reed opener blade comprising a blade portion having a leading edge for entering a reed between adjacent reed dents; a reed opener body comprising a portion of a disc, a surface of said disc portion forming at least a portion of said cam surface; and means to retain said reed opener blade in cooperating relationship with said reed opener body to form said cam surface.

4,215,456

METHOD OF MANUFACTURING AN ELECTRIC LAMP

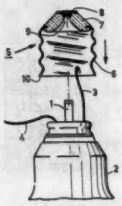
Jan R. Buunk; Bernardus M. A. Dorsemagen, and Johannes G. H. Van Dijkman, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,825

Claims priority, application Netherlands, Sep. 23, 1977, 7710409

Int. Cl.[2] H01J *9/18*

U.S. Cl. 29—25.13 **3 Claims**



1. A method of manufacturing an electric lamp which comprises: providing a light-pervious lamp envelope having an electric light generating element disposed therein and at least one current supply wire fixed to the element, providing the lamp envelope with a lamp cap having an aperture, folding the one wire back on itself at its free end, then threading the one wire through the aperture in the lamp cap, connecting the one wire to the lamp cap near the aperture.

4,215,457

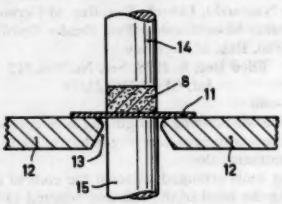
RAPID HEATING DISPENSER CATHODE IN A HOLDER AND METHOD OF MANUFACTURING THE SAME

Adrianus Kuiper; Paulus R. Boelens, and Jacob Blanken, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 815,288, Jul. 13, 1977, abandoned. This application Nov. 16, 1978, Ser. No. 961,433

Int. Cl.[2] H01J *9/12*

U.S. Cl. 29—25.14 **5 Claims**



1. A method of manufacturing a dispenser cathode in which a porous sintered molding of refractory metal impregnated

with electron emissive material in the pores thereof is embedded in a holder, comprising the steps of:

placing the molding in contact with a flat metal foil having a thickness of 10 to 100 microns; and

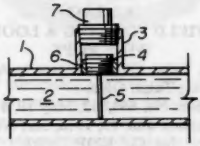
mechanically forming the metal foil into a holder surrounding the sides and the rear of the molding while leaving the front surface of the molding exposed by pressing the molding through an apertured die by means of a pressing tool, the molding acting as a plunger to draw the metal foil over the molding, such that any gap between the molding and the sidewall of the holder is less than 10 microns wide.

4,215,458

EXTRACTOR TOOL

Robert D. Lancaster, 4902 Mayfair, Bellaire, Tex. 77401

Filed Feb. 9, 1979, Ser. No. 10,635
Int. Cl.² B23P *19/04*
U.S. Cl. 29—213 R **15 Claims**



1. A tool for handling elements to be used with a pressurized vessel comprising:

housing means having connection means on one end thereof for connecting said housing in fluid communication with an opening in said vessel;

carrier means disposed in said housing means for reciprocation therein having engagement means at one end thereof for engagement with said elements;

first operator means carried by said housing and engageable with said carrier means for reciprocation of said carrier means between a first terminal position in which said elements, if engaged by said engagement means, are removed from said vessel and a second position in which said elements, if engaged by said engagement means, are inserted within said vessel through said opening thereinto; and

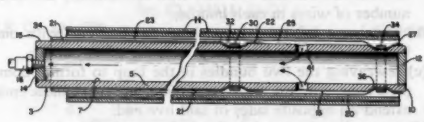
second operator means carried by said housing and engageable with said carrier means for rotation of said elements.

4,215,459

METHOD OF REMOVING HOSE FROM A MANDREL AND A MANDREL ADAPTED TO THE METHOD

Harry T. Kifor, Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 9, 1978, Ser. No. 959,407
Int. Cl.² B65H *81/06*
U.S. Cl. 29—426.1 **9 Claims**



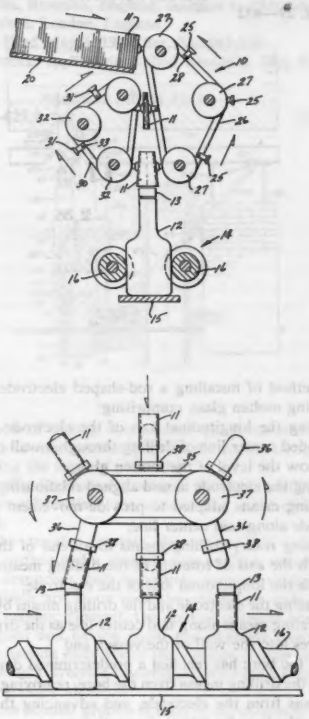
1. The method of removing hose from a hard cylindrical mandrel on which said hose has been built comprising before building said hose covering said mandrel with a thin tough flexible film non-adherent to said mandrel and forming thereon a snugly fitting tube overlying the length and girth of said mandrel, and securing one end of said tube circumferencially to the adjacent one end of said mandrel, then after building said hose moving the tube and the hose together lengthwise relatively oppositely of the mandrel, the relative movement of the hose being toward the secured end of said tube, and concurrently evaginating the tube progressively from the hose.

4,215,460

APPARATUS AND METHOD FOR ASSEMBLYING TUBULAR SLEEVE PREFORMS AND CONTAINERS

Stephen W. Amberg, and Ralph G. Amberg, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sep. 5, 1978, Ser. No. 939,547
Int. Cl.² B23P *19/00, 19/04;* **B29C** *7/30*
U.S. Cl. 29—429 **22 Claims**



1. Combined apparatus for applying a tubular band to an article continuously moving along a horizontal path comprising means for supplying a preformed heat-shrinkable semi-rigid tubular band in flat-folded condition, vacuum means adapted to movement downwardly and divergently to grip juxtaposed exterior surfaces of said band and to effect its major opening while transporting the same along a downward path, means for continuously conveying the article in upright timed relation with its upper extremity closely adjacent and physically contacting the lower extremity of a lowered open band while still retained by said vacuum means, said band having a slightly greater diameter than the exterior diameter of an upper portion of said article, said vacuum means being pivotally mounted to facilitate pivotal movement of said band upon contact by said article to assist its delivery thereon.

16. The method of applying a tubular band to the upper portions of a container comprising the steps of supplying a preformed heat-shrinkable semi-rigid tubular band in flat-folded condition, transporting said band downwardly by a pair of vacuum cups moving downwardly and divergently gripping opposing exterior surfaces of said band for opening same,

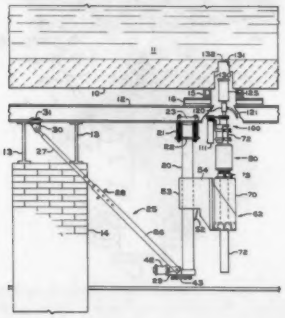
conveying the said container in upright timed relation so that its upper portion contacts the lower extremity of said band, and telescoping said band over the upper portion of said container during their intersecting travel.

4,215,461

METHOD FOR INSERTING ELECTRODES INTO GLASS MELTING TANKS

Richard A. Caripolti, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 31, 1979, Ser. No. 8,015
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 **7 Claims**



1. Method of installing a rod-shaped electrode in a vessel containing molten glass, comprising:

aligning the longitudinal axis of the electrode with an intended center line of drilling through a wall of the vessel below the level of the molten glass;

affixing the electrode in said aligned relationship to reciprocating means adapted to provide movement of the electrode along said center line;

fastening rotary drilling means to an end of the electrode with the axis of rotation of the drilling means coincident with the longitudinal axis of the electrode;

advancing the electrode and the drilling means by said reciprocating means along said center line as the drilling means bores into the wall of the vessel; and

when the bore has reached a predetermined depth, retracting the drilling means from the bore, removing the drilling means from the electrode, and advancing the electrode into the bore by said reciprocating means.

4,215,462

METHOD OF MAKING A TRANSLUCENT OPTICAL DIFFUSER FOR A LAMP

Emile C. Fernandez, 104 Lake Winnesmissitt Dr., Deland, Fla. 32720

Filed Dec. 4, 1978, Ser. No. 965,936
Int. Cl.[3] B23P *11/02*
U.S. Cl. 29—448 **8 Claims**

1. A method for transforming an untreated animal bladder into a translucent optical diffuser for a lamp comprising the steps of:

a. rinsing the bladder in a disinfectant solution;

b. inflating the bladder into a tightly stretched sperical configuration;

c. drying and then storing the bladder in an inflated condition;

d. moistening the bladder in water;

e. providing a form for the lamp diffuser;

f. fitting a section of the moist bladder to the form and securing the section to the form; and

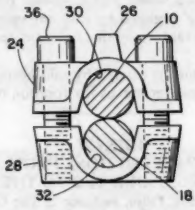
g. applying liquid wax to both sides of the bladder section while said section remains moist.

4,215,463

METHOD OF FIELD FORMING A LOOP SPLICE FOR WIRE ROPE

Edward J. Crook, Tulsa, Okla., assignor to American Hoist & Derrick Company, Tulsa, Okla.

Continuation of Ser. No. 684,562, May 10, 1976, abandoned.
This application Jun. 15, 1978, Ser. No. 915,929
Int. Cl.[2] B23P *25/00*
U.S. Cl. 29—461 **1 Claim**



1. The method of field forming a loop splice at the live end of wire rope comprising the step of:

(a) unravelling a selected length of said live end of wire rope to form two bundles of wires, with substantially the same number of wires in each bundle;

(b) forming a left-hand loop about the live end with one bundle and a right-hand loop with the other bundle;

(c) reweaving the two bundles in the loop to form a complete rope, until the loop is complete, and two bundle ends extend on opposite sides of said live end;

(d) reweaving the two bundles to form a dead end rope;

(e) positioning a top half of a clamp on said live-end;

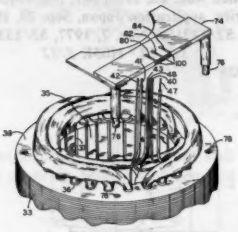
(f) positioning a bottom half of said clamp opposite said top half, the bottom half having a portion that slopes upwardly and so positioned that the sloping portion shields the terminus of the dead end; and

(g) drawing and retaining said top and bottom halves together at two longitudinally spaced points on each side of said dead and live ends.

4,215,464
METHOD OF MAKING A STATOR CONNECTION ASSEMBLY

Sammy L. Miller, Singapore, Singapore, assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 25, 1977, Ser. No. 844,915
Int. Cl.[2] H02K *15/00*
U.S. Cl. 29—596 18 Claims

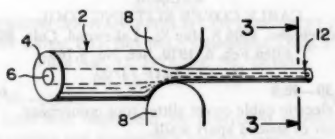


1. A method of fabricating a dynamoelectric machine stator assembly including a magnetic core having axially extending slots, at least one winding formed from multiple turns of a conductor and having end turn portions thereof disposed about at least one face of the magnetic core, and at least two lead wires electrically interconnected with tap wires of the at least one winding, said method comprising: extending tap wires of the at least one winding to a common connecting region; deforming the end turn portions into a predetermined configuration including a deformed section on the outer periphery of the end turn portions for receiving a connection insulator; connecting a first lead wire to at least one tap wire and thereby establishing a connection point; connecting a second lead wire to at least one other tap wire and thereby establishing another connection point; relatively moving a connection insulator having a plurality of holsters and the connection points so that each connection point and wires extending therefrom are relatively moved through an aperture at one end of the respective holster and so that each connection point is disposed within a respective holster for supporting and electrically isolating each connection point; positioning and retaining said connection insulator against the outer periphery of said deformed end turn portions of the at least one winding so that wires interconnected by the connection points extend through respective apertures at one end of the connection insulator; and securing the connection insulator to said deformed section of the end turn portions at the outer periphery thereof.

4,215,465
METHOD OF MAKING V_3Ga SUPERCONDUCTORS

David Dew-Hughes, Bellport, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 6, 1978, Ser. No. 967,178
Int. Cl.[2] H01L *39/24*
U.S. Cl. 29—599 6 Claims



1. A method of making a composite superconductor having V_3Ga as the superconducting component comprising:

providing an elongated core member consisting essentially of vanadium alloyed with 0.1 to 25.0 atomic percent aluminum;

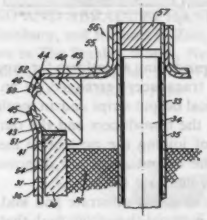
encasing said core with a sheath consisting essentially of copper alloyed with 0.1 to 30.0 atomic percent gallium; and

heating the resulting composite to a temperature high enough and for a period of time sufficient to form a layer of V_3Ga between said core and said sheath.

4,215,466
METHOD OF SEALING CERAMIC ELECTROLYTE MATERIAL IN ELECTROCHEMICAL CELLS

Peter J. Bindin, Runcorn, England, assignor to Chloride Silent Power Limited, London, England

Filed May 3, 1978, Ser. No. 902,528
Claims priority, application United Kingdom, May 5, 1977, 18870/77
Int. Cl.[2] H01M *10/38*
U.S. Cl. 29—623.2 7 Claims



1. A method of sealing two annular metal members to an open end of a ceramic electrolyte tube for an electrochemical cell comprising the steps of providing

a rigid annular element of a ceramic having a coefficient of expansion substantially the same as that of the electrolyte material;

forming the annular ceramic element with a cylindrical interior surface and a shaped outer surface, which outer surface comprises two oppositely tapered conical portions, which are at or near the respective ends of the annular ceramic element, the conical portions being axially aligned and having equal and opposite tapers such that the outside diameter of the annular ceramic element decreases in a direction towards the respective ends of the annular ceramic element;

providing an annular groove in each of the conically shaped outer surface portions of said annular ceramic element;

securing the annular ceramic element around the electrolyte tube;

forming said annular metal members of a material having a coefficient of thermal expansion greater than that of the ceramic material;

putting conical metal elements or coatings over the conical surfaces on the annular ceramic element, such metal elements or coatings being of relatively soft material compared with said annular metal members;

putting said annular metal members over the respective soft metal covered upper and lower tapered surfaces of the annular ceramic element, the annular metal members having internal tapers corresponding to the external tapers on the annular ceramic element;

and then forcing the annular metal members axially towards one another by applying equal and opposite forces thereto, acting in the axial direction of the assembly, so as to deform the soft metal between the annular metal members and the annular ceramic element and thereby to secure the metal members of the ceramic element;

the assembly comprising the annular element and the metal elements or coatings and the metal members being heated

before or while forcing the metal members into tight engagement with the ceramic material.

4,215,467

METHOD OF PRODUCING A MAGNETIC HEAD PLATFORM

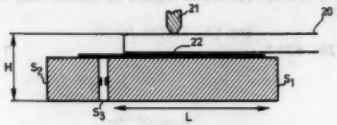
Jean P. Lazzari, Montfort l'Amaury, and Jean Desserre, Rambouillet, both of France, assignors to Compagnie Internationale pour l'Informatique, Paris, France

Division of Ser. No. 882,592, Mar. 2, 1978. This application Oct. 4, 1978, Ser. No. 948,410

Claims priority, application France, Mar. 18, 1977, 77 08168

Int. Cl.[2] H05K *3/32*

U.S. Cl. 29—841 **18 Claims**



1. A method of producing a platform for supporting a plurality of integrating transducers arranged on an insulative base and having electrical output strips and an insulating protective member covering the transducers and the output strips comprising the steps of joining the protective member to a substrate such that the output strips are disposed between said protective member and said substrate,

treating a surface of said substrate and said member to remove surface material therefrom such that the ends of the output strips extend slightly beyond the treated surface,

depositing conductive strips of material on said treated surface and in contact with the ends of the output strips such that at least one conductive strip is connected in common to an output strip of two integrating tranducers, and

connecting a connector to said conductive strips.

4,215,468

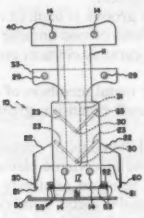
IC EXTRACTION TOOL

Paul L. Greco, New York, N.Y., assignor to O.K. Machine and Tool Corp., New York, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,265

Int. Cl.[3] H05K *3/32*

U.S. Cl. 29—764 **11 Claims**



1. A packaged IC extraction tool comprising a handle portion having a bottom, means at the handle bottom forming a cavity for receiving the IC package, gripping means on the handle portion adjacent the cavity for gripping opposite sides of the IC package, said cavity being formed by opposed depending edges on the handle portion and by said gripping means, said gripping means comprising a pair of slideable telescoping members, means on the handle portion for actuating the gripping means from an open rest position allowing the package to enter the cavity to a gripping position where they contact the package, and means connected to the gripping means for developing a pulling force on the package capable of extracting the IC.

4,215,469

METHOD OF INSERTING ELECTRONIC COMPONENTS TO A PRINTED CIRCUIT BOARD

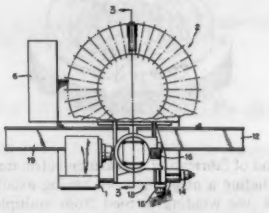
Koichi Asai, Nagoya, and Tousuke Kawada, Chiryu, both of Japan, assignors to Fuji Mgf. Co., Ltd., Aichi, Japan

Filed Aug. 22, 1978, Ser. No. 936,578

Claims priority, application Japan, Sep. 29, 1977, 52/117227; Oct. 12, 1977, 52/122159; Nov. 7, 1977, 52/133189

Int. Cl.[3] H05K *3/32*

U.S. Cl. 29—835 **8 Claims**



1. A method of inserting electronic components in order to a printed circuit board having electronic inserting space and lead wire inserting holes comprising steps of:

holding a pair of lead wires of one component from among plural electronic components having a variety of nominal inter-lead-wire distances, with an actual inter-lead-wire distance substantially equal to the nominal inter-lead-wire distance of said one component, by a chuck which is open-and-closable in perpendicular direction to a plane including said pair of lead wires at one biased side of said chuck such that one of said pair of lead wires is located at a preset base position in the vicinity of one edge of said chuck;

positioning said chuck exactly above a pair of targeted holes in said inserting space of said circuit board, such that already inserted components on said circuit board are positioned nearby said one edge of said chuck;

inserting said pair of lead wires held by said chuck into said pair of targeted holes;

applying clinching treatment to said pair of lead wires protruded to the back of said circuit board; and

repeating the holding step, the positioning step, the inserting step and the step of applying clinching treatment, for another component having a different lead-wire-distance from that of said one component from among said plural electronic components, moving in a direction away from one end of said inserting space;

whereby electronic components of a variety of nominal inter-lead-wire distances are inserted and clinched in order on said circuit board starting from one end of electronic component inserting space thereof.

4,215,470

CABLE COVER SLITTING TOOL

Jerry Chirichigno, 1306 S. Jay St., Lakewood, Colo. 80215

Filed Feb. 6, 1979, Ser. No. 9,763

Int. Cl.[2] B21F *13/00*

U.S. Cl. 30—90.8 **6 Claims**

1. An electric cable cover slitter tool comprising,

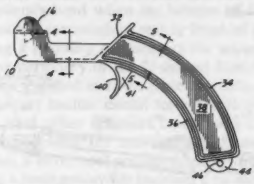
(a) a pair of spaced apart walls,

(b) a short top wall, of substantially less than the length of said pair of spaced apart walls, joining said spaced apart walls at the front portion thereof,

(c) a bottom wall joining said spaced apart walls from a point adjacent to and spaced rearwardly from said short top

wall leaving an opening for cables and terminating in a wall section angled from the plane of said bottom wall forming a cable release,

(d) handle means depending from said pair of spaced apart walls, and



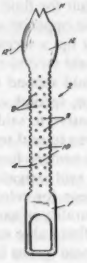
(e) knife means secured in said short top wall in position to slit a cable covering passing between said spaced apart wall.

4,215,471

FRUIT KNIFE

Hans-Joachim Schaefer, Gymnasiumstrasse 7, D-6380 Bad Homburg, Fed. Rep. of Germany

Filed Jun. 23, 1978, Ser. No. 918,363
Int. Cl.² B26B *9/02*; A47J *17/04*
U.S. Cl. 30—147 **22 Claims**



1. A fruit knife, comprising a handle; and an elongated blade connected with said handle and having a plurality of throughgoing apertures permitting the juice produced during movement of the blade through the fruit to flow through said apertures and thereby preventing spurting of the juice, said apertures being spaced from one another in the direction of elongation of said blade and arranged in rows which are spaced from one another in a direction substantially transverse to the direction of elongation of said blade, said blade having a substantially straight portion connected to said handle, and a substantially curved portion connected to said straight portion, said portions of said blade extending and being spaced from one another in the direction of elongation of said blade cutter.

4,215,472

HIGH-PRESSURE HAND-HELD CUTTING IMPLEMENT

M. Robert Raven, P.O. Box 5617, Charleston, Oreg. 97420

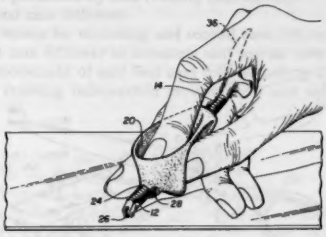
Filed Apr. 12, 1979, Ser. No. 29,185
Int. Cl.² C03B *33/10*
U.S. Cl. 30—164.95 **11 Claims**

1. A hand-held implement for controlled relatively high pressure cutting and scoring of a material comprising:

a grip having depressions for receiving the thumb, forefinger and middle finger;

a member extending forwardly of said grip and having an edge for cutting or scoring said material; and

a shaft extending rearwardly of said grip and adapted for placement between the knuckles for stabilizing and adding



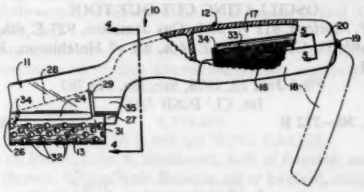
additional pressure to said cutting member during cutting or scoring.

4,215,473

CUTTING AND ABRADING HAND TOOL

James Elmore, Simsbury, and Richard E. Ziel, Cheshire, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Dec. 21, 1978, Ser. No. 972,000
Int. Cl.² B23D *71/08*
U.S. Cl. 30—172 **10 Claims**



1. A cutting or abrading hand tool comprising a blade holder of generally rectangular shape having side walls with parallel outer side surfaces, each having a longitudinal groove therein forming a pair of outwardly and oppositely facing parallel grooves, a replaceable generally tubular blade having a cutting or abrading surface and having a longitudinal slot extending end to end thereof and bounded by inwardly extending parallel flanges dimensioned to engage in and have a slip fit with the outwardly facing parallel grooves of the holder, abutments on the blade holder at opposite ends of the grooves normally engageable by the ends of the blade flanges thereby preventing longitudinal movement of the blade relative to the holder, the abutments at one end of the holder being formed on an inwardly flexible portion of the holder which can be manually flexed inwardly to permit the blade to be mounted on or removed from the blade holder by inserting or withdrawing the blade flanges into or out of the grooves while moving the blade longitudinally of the holder.

4,215,474

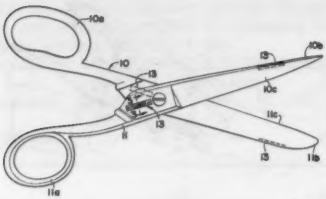
HAIR SHEARS

Thomas G. Kelley, 3645 E. 147th St., Cleveland, Ohio 44128

Filed Oct. 30, 1978, Ser. No. 955,933
Int. Cl.² B26B *13/22*
U.S. Cl. 30—233 **3 Claims**

1. Hair cutting shears, comprising two generally linear blade members, each having a hand-hold end and a pointed cutting end, a pivot connection between said blade members intermediate their ends securing them in parallel oscillatable cutting relationship, each of said blade members having on its inner side a longitudinally extending linear cutting edge extending from said pivot connection to said pointed cutting end, four spirit levels rigidly secured to said blade members, one spirit

level on the outer face of each blade member adjacent said pivot connection on the hand-hold side thereof, and one spirit level on the outer edge of each blade member near its pointed



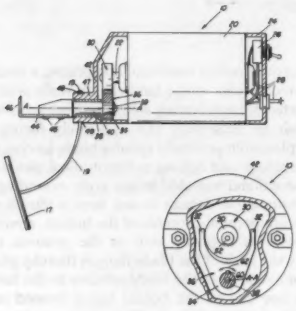
cutting end and visible in the plane of said blade member from the outside, all of said spirit levels extending longitudinally of the associated blade member.

4,215,475

OSCILLATING CUT-OUT TOOL

Gary W. Morford, 811 W. 25th; Guy Jamieson, 927 E. 6th, and Kenneth D. Gould, 1114 E. 6th, all of Hutchinson, Kans. 67501

Filed Jun. 12, 1978, Ser. No. 914,787
Int. Cl.[3] B26B *7/00*
U.S. Cl. 30—272 R **4 Claims**



1. An oscillating cut-out tool used for removing a windshield from a vehicle, the tool comprising:

a motor having a motor drive shaft;

an eccentric attached to said drive shaft;

a yoke having a yoke neck and two outwardly extending yoke arms, said eccentric disposed between said yoke arms, said eccentric imparting an oscillating motion on said yoke when said eccentric is rotated by said drive shaft;

an oscillating shaft having one end attached to said yoke neck, said yoke imparting an oscillating motion about an axis along the length of the oscillating shaft and through the center thereof; and

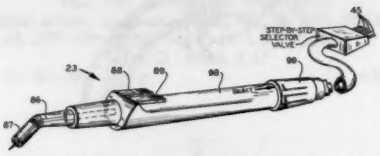
an "L" shaped oscillating cutting blade with the long leg thereof attached to the periphery of said oscillating shaft such that the axis of rotation of said shaft with attached blade passes through substantially the mid-portion of the short leg of the "L" shaped blade.

4,215,476

HEALTH SERVICES COMBINATION IRRIGATOR AND ASPIRATOR

Alexander S. Armstrong, 5679 Monroe St., Sylvania, Ohio 43560

Filed Mar. 25, 1977, Ser. No. 781,212
Int. Cl.[2] A61C *17/04;* A61M *1/00*
U.S. Cl. 433—80 **7 Claims**



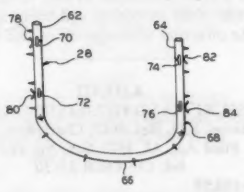
1. A system for irrigating and aspirating a tooth cavity comprising an elongate handpiece having first and second ends; a first tip on said first end of said handpiece; a second tip on said first end of said handpiece coaxial with adjacent to, encompassing, and spaced radially from said first tip; a first finger operable control on said handpiece adjacent said first end of said handpiece for causing fluid to issue from said first tip; a second finger operable control on said handpiece adjacent said first end of said handpiece and contiguous to said first finger operated control for causing a vacuum to be drawn at said second tip, whereby said first and second finger operated controls are selectively and simultaneously operable with a single finger; a first conduit for fluid extending from said second end of said handpiece opposite said first end and in communication with said first tip; a second conduit for drawing a vacuum extending from said second end of said handpiece and in communication with said second tip; a vacuum source remote from said handpiece; second valve means remote from said handpiece and responsive to said second control for connecting said vacuum source to said second conduit; a plurality of irrigating fluid sources remote from said handpiece; means for imposing a head on said irrigating fluid sources; means remote from said handpiece for selectively coupling each of individual ones of said plurality of said irrigating fluid sources to said first conduit; and first valve means in said first conduit between said first tip and said means for selective coupling and remote from said handpiece, responsive to said first control for controlling the flow of fluids between said selective coupling means and said handpiece.

4,215,477

HOLDER FOR RUBBER DENTAL DAM

Kathleen A. Shanel, 428 Park Blvd., Glen Ellyn, Ill. 60137

Filed Apr. 25, 1977, Ser. No. 790,567
Int. Cl.[2] A61C *5/12*
U.S. Cl. 433—136 **7 Claims**



1. A human facial frame for holding a dental dam, said frame being a generally "U" shape frame means comprising two spaced upright members and a bottom member for extending around and in front of a mandible on the human face, said two upright members of the U-shaped frame means being posi-

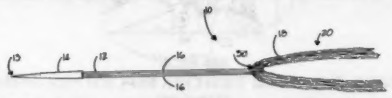
tioned on opposite sides of the face and parallel to a facial plane defined by the nasion and the pogonion of the human face, each of said two upright members being located in the range of approximately one-quarter of the distance extending from the corresponding ear toward the facial plane, with the origin of each of the two upright frame members being located at approximately the gonion on corresponding ones of the opposite sides of the patient's head when the bottom of the U-shaped means is in position surrounding and in front of the chin, the frame including a plurality of fasteners for securing a dental dam around the periphery of the U-shaped frame means after the dam has been installed over the patient's teeth, other fasteners on the frame to anchor dental tape tied in place about a patient's head, said other fasteners comprising a plurality of generally T-shaped slots for enabling the frame to be tied around the head, a horizontal portion of each of said T-shaped slots providing a passageway for enabling a tie member to pass without threading into a vertical portion of said slots to enable vertical orientation of said slots.

4,215,478

DENTAL HYGIENE FLOSSING SYSTEM

Louis O. Thomas, 4745 Convention St., Baton Rouge, La. 70806, and Raymond E. Boudreaux, 4155 Essen La., Apt. 81, Baton Rouge, La. 70809

Filed Mar. 6, 1978, Ser. No. 883,831
Int. Cl.[2] A61C *3/00, 15/00*
U.S. Cl. 433—25 **5 Claims**



1. A dental hygiene device for cleaning interdental spaces comprising:

a. a floss leader assembly adapted for hand placement and subsequent sliding movement between two adjacent teeth, said leader assembly comprising,

(i) a tip member, said tip member being of a generally semi-flexible material; and

(ii) a floss leader line attached to said tip member, said leader line being a string member having its end portions attached to said tip member, there being formed a loop by the attachment of said leader line to said tip member;

b. an elongated "mop" connected to said leader assembly, said "mop" being comprised of a plurality of absorbant cotton threads arranged in a group, and doubled to temporarily attach said plurality of absorbant cotton threads to said floss leader assembly at said loop;

c. connection means for attaching said absorbant "mop" to said leader assembly, said connection means comprising said loop, each of said cotton threads being generally doubled and folded in half through said loop; and

d. fluoride impregnation means for impregnating said plurality of absorbant cotton threads with a therapeutic fluoride agent.

4,215,479

CAM DRIVEN CURVE TRACKING APPARATUS

Julian L. Kavanau, c/o University of California - Dept. of Biology, 405 Hilgard St., Los Angeles, Calif. 90024, and Nils Jernberg, 268 Liberty Rd., Tappan, N.Y. 10983

Filed Sep. 10, 1979, Ser. No. 73,896
Int. Cl.[3] B43L *13/00*
U.S. Cl. 33—27 K **21 Claims**

1. A drawing apparatus for drawing geometric curves generated by a cam means which comprises, in combination:

a base;

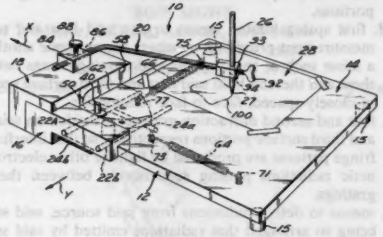
spindle means mounted on said base;

cam means rotatably mounted on said spindle means;

a first cam follower operatively engaged to said base for movement only along a Y axis responsive to a Y component generated by said rotating cam means;

a second cam follower;

guide means for mounting said second cam follower to said first cam follower to constrain said second cam follower to movement of said first cam follower along the Y axis but enabling independent movement of said second cam



follower along an X axis responsive to an X component generated by said cam means whereby the motion of said second cam follower relative to said base is the vector sum of said Y component and said X component;

spring means operative to bias said first and second cam followers to a zero position with respect to said X and Y axis; and

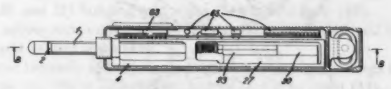
stylus means rigidly affixed to said second cam follower for tracing a curve thus determined by said cam means.

4,215,480

DISTANCE MEASURING GAUGE

John H. Fisher; John D. Bradbrook, both of Royston, and Peter J. Bassett, Foxton Near Royston, all of England, assignors to James Neill Holdings Limited, England

Continuation of Ser. No. 674,987, Apr. 8, 1976, abandoned. This application Dec. 16, 1977, Ser. No. 861,495
Int. Cl.[2] G01B *9/00*
U.S. Cl. 33—125 C **8 Claims**



1. A digital read-out measuring instrument including

A. A source of electromagnetic radiations of the speed of light,

B. a first measuring member,

C. a second measuring member having a measuring head and spaced therefrom and in alignment therewith two spaced bearing members, the first measuring member being slidably carried in the respective bearing members at aligned positions for axial movement towards and away from said measuring head when effecting a measuring operation,

D. a first measurement-providing member of a material which transmits said electromagnetic radiations, aligned axially with said first measuring member and disposed remotely from said measuring head, and having first and second longitudinal surface portions disposed at a given angle relative to one another,

E. a universal-joint coupling means connecting said first measuring member and first measurement-providing member for ensuring simultaneous axial movement of those members towards and away from said measuring head when effecting a measuring operation,

F. a second measurement-providing member of a material

which transmits said electromagnetic radiations, secured to said second measuring member remotely from said measuring head for close cooperation with said first measurement-providing member, and having third and fourth longitudinal surface portions disposed at said given angle relative to one another for cooperation closely with said first and second surface portions respectively,

G. spacing means disposed between opposing ones of said surface portions and comprising thin coatings of a low-friction material applied to at least part of at least one of said surface portions in each pair of opposing surface portions,

H. first spring biasing means urging said first and second measurement-providing members towards one another in a sense such as to compress said spacing means between them and thereby hold said first and third surface portions in closely-spaced, face to face relationship,

I. first and second diffraction gratings provided on said first and third surface portions respectively so that interference fringe patterns are produced by light or other electromagnetic radiations passing successively between the two gratings,

J. means to detect radiations from said source, said source being so arranged that radiations emitted by said source are directed successively through the respective gratings, and said detector means being arranged to detect the interference fringe pattern resulting from the transmission or radiation through the gratings and to provide a pulse output according to changes in the said fringe pattern,

K. a pulse counter connected to the output of said detector means, and

L. digital display means connected to the output of said counter for displaying in response thereto a measurement indicative of the position of said first measuring member relative to said second measuring member.

4,215,481

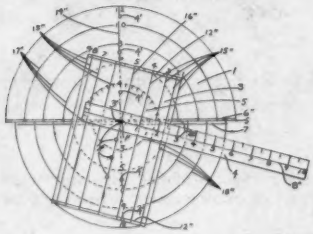
SHEET METAL DRAFTING DEVICE

Robert L. Riley, 1804 Weltin St., Orlando, Fla. 32803

Filed Oct. 12, 1978, Ser. No. 943,990

Int. Cl.³ B43L *13/20*

U.S. Cl. 33—174 N **2 Claims**



1. An instrument for establishing points of curved lines for the purpose of laying out segments of round sheet metal elbows of many different sizes, degree of angle, segments, and throat radiuses, consisting of a metal and/or plastic disk with concentric circular arcs of even and uneven whole sizes, a protractor, a red line running horizontally centered on the disk and the base line of the protractor, two black lines running parallel one on each side of the red line, a black line radiating from the center of the disk, dividing the disk into halves perpendicularly, imprinted on the obverse side of the disk, a series of holes spaced on the perpendicular line with one hole centrally located to pivotally connect one of a number of transparent, rectangular plastic elements with unequally spaced parallel longitudinal lines representing equally spaced lines on a pipe surface curved transversely to said lines, a line on each end of the rectangular elements to serve as a base line, a series of holes in the rectangular member running down the center line, the rectangular members represent round pipe of a like width, a transparent ruler with a red center line, a scale along the center line, and two holes in the center line wth means of pivotally connecting one of the holes in a rectangular element and the scale ruler to the center hole of the disk atop the protractor at a predetermined degree, the intersections of the unequally spaced lines from the base line of the rectangular element to a horizontal line on the disk will produce the lines needed in the procedure of laying out elbow templates.

4,215,482

POSITION OF A WORKPIECE IN A ROLL TURNING LATHE

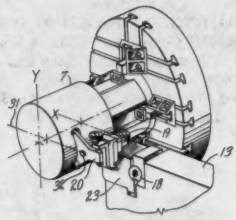
Richard S. Szewczyk, Rochester, N.Y., assignor to USM Corporation, Farmington, Conn.

Continuation of Ser. No. 697,574, Jun. 18, 1976, abandoned.

This application Apr. 21, 1978, Ser. No. 898,830

Int. Cl.² G01B *5/25*

U.S. Cl. 33—181 R **5 Claims**



1. An alignment device for use in determining whether a first and a second lingitudinally adjacent cylindrical members are each coaxially aligned with one another on a turning machine, the alignment device comprising:

a first gauging means for detecting a misalignment of the axis of the first cylindrical member in respect to the horizontal plane aligned with the axis of rotation of the second cylindrical member;

a second gauging means for detecting a misalignment of the axis of the first cylindrical member in respect to the vertical plane aligned with the axis of rotation of the second cylindrical member;

said first and second gauging means both being mounted on a movable support to one side of the axis of rotation of said turning machine, said support being movable to permit movement of said first and second gauging means parallel to the axis of rotation of said second cylindrical member, both of said gauges being mounted on the side of the axis of rotation of said turning machine to permit a large variation in the diameters of any first cylindrical members to be aligned and turned thereon;

said first gauging means comprising a first probe constructed to make contact with a cylindrical surface at two points spaced apart on a circumference of the cylindrical surface, said probe being mounted for pivotal movement in a plane containing the two points of contact and their circumference;

a first deflection indicator of said gauging means mechanically arranged to indicate pivotal movement of the first probe in said plane; and

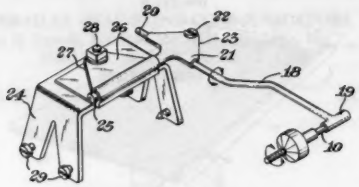
said second gauging means comprising a second probe constructed to make contact with a cylindrical surface at one point thereon intermediate said two points contacted by said first probe, said second probe having a second deflection indicator mechanically arranged therewith to indicate linear displacement of said second probe, said first and second gauging means both being juxtaposed on said movable support to permit ease of coaxial alignment of said first and second cylindrical members.

4,215,483

DRILL SHARPENING GAUGE

Wilbur A. Marshall, Rt. 2, Box 96 C, Aurora, Mo. 65605

Filed Feb. 5, 1979, Ser. No. 9,662
Int. Cl.[3] G01B 5/20
U.S. Cl. 33—201 2 Claims



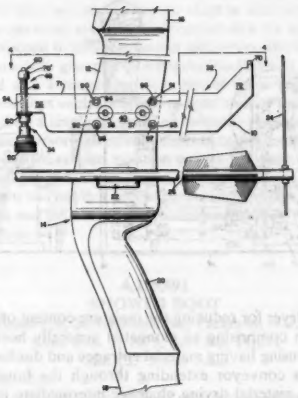
1. Mounting device for a caliper gauge comprising a mounting arm and a clamping means, said mounting arm having a first end and a second end, the first end operatively engaging said caliper gauge and said second end being operatively engaged by said clamping means, said clamping means comprising a first and a second tightenable sleeve, said first sleeve directly engaging said mounting arm, said first sleeve having a mounting portion; said second sleeve engaging the mounting portion of said first sleeve; said second sleeve being rotatably mounted on a support which is adapted to be connected to the guard of a motor-driven abrasive wheel, thereby permitting controlled rotatable horizontal and vertical movement of said arm.

4,215,484

AIMING DEVICE FOR ARCHERY BOWS AND OTHER OBJECTS

Robert F. Lauffenburger, 726 Cobham Park Rd., Warren, Pa. 16365

Filed Nov. 7, 1978, Ser. No. 958,418
Int. Cl.[2] F41G 1/46
U.S. Cl. 33—265 16 Claims



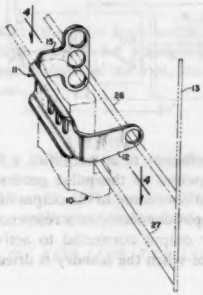
1. An aiming device for an archery bow or other object comprising a sight-supporting base, fastening means adapted to secure said base to a portion of said bow or said object, front and rear sights positioned on said base, and adjusting means providing for the non-pivotal displacement of said base laterally of said bow or object and also providing for the pivotal displacement of said base about each one of two mutually transverse axes which lie in a plane extending longitudinally of said bow, said fastening means comprising a plurality of first threaded members adapted to be threaded into the central section of said bow above the bow's handgrip to provide for the attachment of said base to said central section on one pre-selected side thereof, said adjusting means comprising a rigid member positioned between said base and said one pre-selected side of said central section, and a plurality of second threaded members mounted on said base for individual selective displacement relative thereto and coacting with said rigid member to provide for the adjustment of said base relative to said rigid member and said central section.

4,215,485

BOW SIGHT

Gilbert T. Mesler, R.D. #1, Ashville, N.Y. 14710

Filed Apr. 23, 1979, Ser. No. 32,300
Int. Cl.[2] F41G 1/00; F41B 5/00
U.S. Cl. 33—265 5 Claims



1. In combination, a bow and a bow sight (11) comprising,
a bow (10) and a sight (11),
said bow (10) having a body (12),
and a bow string (13),
said bow sight (11) comprising a sheet of metallic material said metallic material having a first end part (12) and a second end part (15) and an intermediate part (14),
said first end part (12), said second end part (15) being integrally attached to said intermediate part (14),
spaced laterally extending openings (19, 20 and 21) in said intermediate part of said bow sight,
fastening means (23) in said laterally extending openings (19, 20 and 21) holding said sight (11) to said bow (10),
an arrow receiving opening (22) in the distal end of said first end of said sight (11),
three laterally spaced second arrow receiving openings (23, 24 and 25) in said second end of said bow sight (11),
said first end and said second end being bent at right angles to said intermediate portion (14) with said openings (22) in said first end (12) in alignment with one of said openings in said second end providing a peep sight.

4,215,486

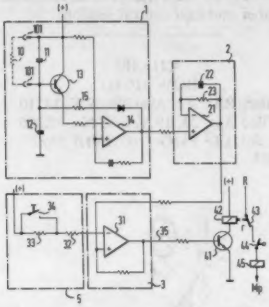
CIRCUIT FOR CONTROLLING A DRYER-PROGRAM SWITCHING DEVICE

Günter Heyer, and Hans Böddeker, both of Amberg, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,636
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1977, 2751277
Int. Cl.[2] F26B 11/04
U.S. Cl. 34—45 2 Claims

1. Circuit for controlling a program switching device of a laundry dryer as a function of the moisture-dependent resistance of the laundry in the dryer, in which spaced sensing electrodes are disposed in the dryer and bridged by the laundry with resistance between the electrodes varying depending on moisture content of the laundry, a pulse generator connected

to the electrodes and having at the pulse generator output a pulse train with a duty cycle-frequency depending on the magnitude of the laundry resistance, said pulse generator formed by a storage capacitor charged from a d-c source and a resistor which together with laundry resistance determines the duty cycle-frequency, and a transistor connected as an



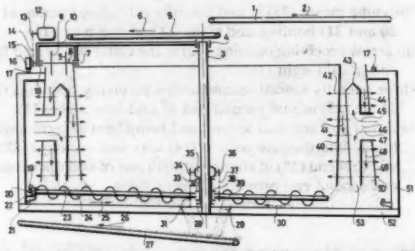
impedance transformer to an amplifier, a filter member connected to the output of the pulse generator, a comparator having one input connected to the output of the filter member, and a second input connected to a reference value setter, and the comparator output connected to activate said program switching device when the laundry is dried to a set moisture content.

4,215,487

DRYING EQUIPMENT

Zoltán Ónodi; Sándor Mikola; Ferenc Farkas, and István Kovács, all of Mezötur, Hungary, assignors to Szolnok Megyei Tegla- es Cserepipari Vallalat, Mezotur, Hungary

Filed Sep. 28, 1978, Ser. No. 946,518
Claims priority, application Hungary, Oct. 6, 1977, SO 1198
Int. Cl.[2] F26B *17/12*
U.S. Cl. 34—167 **6 Claims**



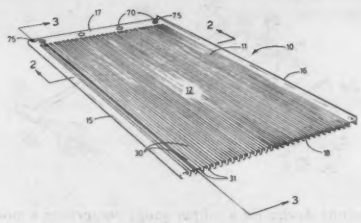
1. In drying equipment for reducing the moisture content of fragmentary material, comprising upright latticed walls defining between them a drying space in the form of a ring of circular or polygonal base, means for conveying material to be dried to an upper portion of said drying space, and means for removing dried material from a lower portion of said drying space; the improvement comprising conveyor means extending from adjacent the center of said ring radially outwardly of the ring over said drying space for delivering material to be dried from adjacent the center of the ring outwardly to said drying space, and means for rotating said conveying means about the center of the ring thereby to distribute said material in said drying space about said ring.

4,215,488

TRAY FOR THE FIELD DRYING OF FRUIT

Paul Donabedian, P.O. Box 150, Selma, Calif. 93226

Filed Jan. 8, 1979, Ser. No. 1,703
Int. Cl.[2] F26B *25/18*
U.S. Cl. 34—238 **11 Claims**



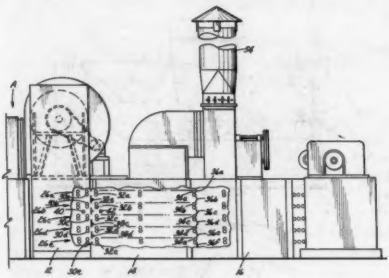
1. A tray for the field drying of fruit comprising a substantially planar rectangular sheet of plastic material adapted to receive fruit to be dried thereon when the tray is disposed on the ground, said tray having substantially parallel side edges, being longitudinally corrugated, to resist longitudinal flexibility and transversely foldable over fruit received thereon to form a roll encapsulating the fruit, said edges being fitted for releasable latched engagement when the tray is transversely folded to maintain the tray in said rolled configuration, substantially coextensively with the length of the sheet.

4,215,489

ROLLER DRYER

Irven J. McMahon, Jr., Painesville, Ohio, assignor to The Coe Manufacturing Company, Painesville, Ohio

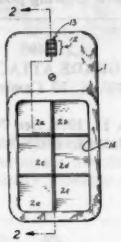
Continuation of Ser. No. 743,759, Nov. 22, 1976, abandoned. This application Jul. 17, 1978, Ser. No. 924,889
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—242 **9 Claims**



1. In a dryer for reducing the moisture content of material in sheet form comprising an elongated generally horizontal stationary housing having material entrance and discharge ends, a continuous conveyor extending through the housing which includes a material drying chamber intermediate its ends and through which the conveyor extends, means externally of the drying chamber for producing a flow of gas lengthwise therethrough in the direction in which the material is conveyed through said drying chamber and maintaining a gas pressure less than atmospheric in the material exit end of the drying chamber, and means for heating the gas, the improvement comprising providing a gas seal chamber at the material discharge end of said drying chamber, means adjacent to the material discharge end of said seal chamber for restricting the flow of gas into said seal chamber, power actuated means connected to said seal chamber for exhausting gas from said

seal chamber, and means for controlling the amount of gas exhausted from said seal chamber by said exhaust means whereby the gas pressure in said seal chamber may be maintained less than that of the subatmospheric gas pressure in the material exit end of the drying chamber.

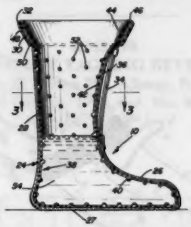
4,215,490
BRAILLE DEAF-BLIND COMMUNICATORS
William B. Fewell, 124 Dow Rd., Port Charlotte, Fla.
Filed Nov. 16, 1977, Ser. No. 852,145
Int. Cl.[2] G09B *21/04*
U.S. Cl. 35—35 A **5 Claims**



1. A portable hand held Braille-like communication apparatus comprising a housing, a cover for said housing, a platform in said housing, a six-key keyboard mounted in a cut-out portion of said cover, each key of said keyboard having a stem passing through said platform, a key arm corresponding to each key disposed below said platform and having an end in engagement with the stem of said key and another end provided with a pointed projection, pivot means for each key arm for causing said pointed projection to project through an aperture in said cover when the key actuating said key arm is depressed away from a rest position, and biasing means urging said key and key arm to said rest position, wherein said pivot means for said key arm is a convex projecting portion intermediary said ends of said key arm, said projecting portion being disposed in corresponding contour slots in said housing, said pointed projections are closely grouped as a six unit Braille-like cell disposed in said aperture in said cover, the keys of said keyboard are also grouped as a Braille-like cell and are closely juxtaposed and arranged in an array of three superimposed rows of two keys each such that at least two of said keys may be actuated by a single finger of a transmitter person, whereby a transmitter person selectively depressing any number of said keys in a predetermined position causes the same number of said pointed projections to project through said aperture in the same pattern to enable a receiving person to feel said pointed projections and determine the character formed by said transmitter person.

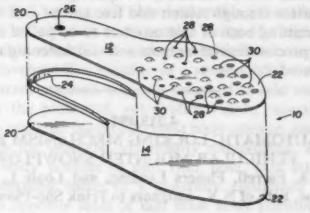
4,215,491
SHOWER BOOT
Anthony Giannetti, 36 Highland St., Paterson, N.J. 07524
Filed Feb. 9, 1979, Ser. No. 11,091
Int. Cl.[2] A43B *5/08*
U.S. Cl. 36—8.1 **6 Claims**

1. A boot for use on each foot of a person taking a shower bath for soaking, scrubbing, washing and massaging the feet while the person is taking a shower bath, said boot comprising an outer body including a foot enclosing portion and an upwardly extending ankle and lower leg region enclosing portion shaped to conform with and enclose the corresponding foot, ankle and lower leg region of the person wearing the boot in a manner to enable limited relative movement between the boot and foot, ankle and leg region of the wearer, the upper end of the leg region enclosing portion of the boot being outwardly flared to funnel water into the interior of the boot as it falls downwardly or runs downwardly along the leg of the wearer, said outer body being constructed of resilient, flexible, shape sustaining, waterproof material, and an inner liner disposed within said outer body and conforming therewith, said inner liner being constructed of resilient, flexible material conform-



ing with the interior of the outer body and including inwardly extending projections thereon for massaging, scrubbing and washing the external surfaces of the foot, ankle and lower leg region of the wearer.

4,215,492
REMOVABLE INNER SOLE FOR FOOTWEAR
Arthur Sandmeier, 3 Av. de Lonay, 1110 Morges, Switzerland
Filed Dec. 29, 1978, Ser. No. 974,311
Claims priority, application Switzerland, Jan. 24, 1978, 1065/78
Int. Cl.[2] A43B *13/38, 7/08, 13/40*
U.S. Cl. 36—44 **11 Claims**



1. An inner sole insertable into and removable from a shoe for automatically ventilating the foot with fresh air during walking movement of the user, said inner sole comprising:

a pair of substantially flat elongated members formed of a resiliently deformable material and shaped peripherally to fit within a shoe;

said members being secured together along their marginal edges to define an elongated envelope bounding a single hollow unobstructed chamber between said members which extends continuously for substantially the full length and width thereof interior of said marginal edges to permit a free and unrestricted passage of air within and throughout said chamber, said envelope having a rearwardly-disposed heel portion and a forwardly-disposed toe portion at opposite ends along the elongation thereof;

means enlarging said chamber at said heel portion to enable the accumulation in said enlarged heel portion of a quantity of air movable therefrom toward said toe portion during walking movement of the user;

air inlet means comprising at least an aperture defined in one of said members at said heel portion through which air is admitted to said chamber;

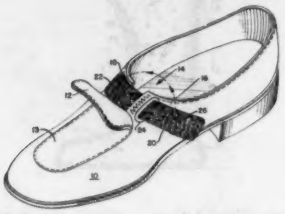
and discharge means comprising a plurality of openings defined in said one member at said toe portion through which the air moved from said enlarged heel portion is discharged from said chamber for automatic ventilation of the foot during walking movement.

4,215,493

ADJUSTABLE INSTEP GORE ASSEMBLY

Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204

Filed Mar. 27, 1978, Ser. No. 890,487
Int. Cl.[2] A43B *11/00*
U.S. Cl. 36—51 **17 Claims**



1. In a shoe having an opening defined by quarters on either side of said opening in combination with an upper vamp, the improvement comprising:

an adjustable instep gore assembly connecting said quarters and underlying said upper vamp, said upper vamp extending beyond said gore assembly said gore assembly including flexible multi-position, co-acting hook and loop fastening means,

a gore strap connected to one of said quarters, said strap having a fixed end and a free end, said free end including at least one fastener pad of said hook and loop fastening means, and

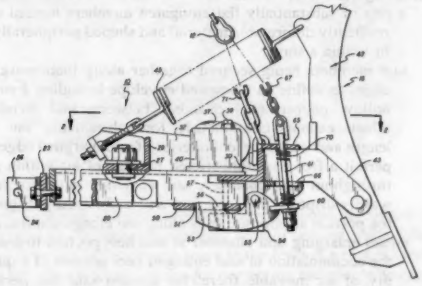
an anchor means including an opening at the other of said quarters through which said free end of said strap passes permitting both of said quarters to be pulled inwardly to the precise desired tautness and said fastening means to be secured.

4,215,494

AUTOMATIC LOCKING MECHANISM FOR VEHICULAR MOUNTED SNOWPLOW

Eugene A. Farrell, Fishers Landing, and Louis L. Montante, Clayton, both of N.Y., assignors to Frink Sno-Plows, Clayton, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,243
Int. Cl.[2] E01H *5/04*
U.S. Cl. 37—42 R **8 Claims**



1. In a vehicle mounted snowplow of the type having a vertically movable support frame that is horizontally extended from the front of the vehicle, lifting means acting upon the frame for raising the blade of the plow above its normal snow clearing position and a blade adjusting means for horizontally positioning the blade which is pivotably supported in the frame for angularly positioning the blade in respect to the frame, the improvement comprising

a sector plate having a series of spaced apart holes formed therein, said plate being secured to the frame of said plow

a rocker arm being pivotably mounted in the blade adjusting means for moving a locking bar between a first plate engaging position wherein the bar is selectively seated within one of the holes formed in said plate and a second plate releasing position wherein said bar is moved out of engagement with one of said holes, and

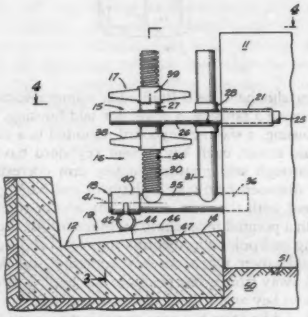
actuating means for automatically urging the locking bar into said first plate engaging position when the frame is supporting the blade in a snow clearing position and for automatically moving the locking bar into said second plate releasing position when the frame is raised to lift the blade from the snow clearing position.

4,215,495

ROAD GRADE ATTACHMENT

Donald G. Wagner, 200 N. El Camino Real #7, Oceanside, Calif. 92054

Filed Sep. 11, 1978, Ser. No. 941,487
Int. Cl.[2] E02F *5/00*
U.S. Cl. 37—109 **5 Claims**



1. In combination with a grader blade of the road grader, a blade support means comprising:

(a) a mounting frame for mounting said blade support means on or at the end of a blade comprising a pair of parallel rods extending substantially horizontally and a pair of sleeves positioned between said rods;

(b) a vertically movable frame consisting of two substantially vertically extending bars which project through said sleeves and a horizontally extending bar at the lower ends of said vertically extending bars, said horizontally extending bar having an end portion adapted to engage the forward surface of said blade;

(c) a universal joint positioned on said horizontal bar of said vertically movable frame; and

(d) a curb shoe having a lower surface adapted to engage a surface of the curbing along the side of said roadway, said curb shoe being supported by said universal joint, said universal joint permitting said curb shoe to slide along said curbing surface in sliding contact therewith.

4,215,496

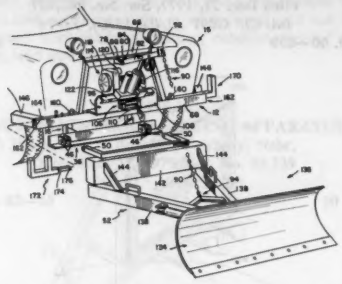
VEHICLE BUMPER

Thomas L. Wehr, R.R. #1, Box 317, Fairland, Ind. 46126

Filed Nov. 13, 1978, Ser. No. 959,509
Int. Cl.[3] E02F *3/76*
U.S. Cl. 37—117.5 **17 Claims**

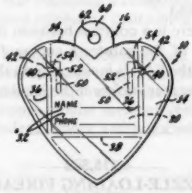
1. A combination for mounting a winch and a snow blade assembly from a vehicle, comprising first means for supporting the winch, means for mounting the first means to extend across the front of the vehicle body, second means extending downwardly and rearwardly from the first means beneath the vehicle body, third means for movably mounting a snow blade

assembly the third means being provided at the distal end of the second means, fourth means for providing a lift arm for the snow blade assembly, the fourth means projecting outwardly



from the front of the vehicle body, the snow blade assembly including support frame means movably mounted from the third means for selectively movably supporting the snow blade.

4,215,497
TAG
John C. Levy, 234 Hoover St., Oceanside, Calif. 92054
Filed Aug. 4, 1978, Ser. No. 931,183
Int. Cl.[2] G09F *03/03*
U.S. Cl. 40—10 R **1 Claim**



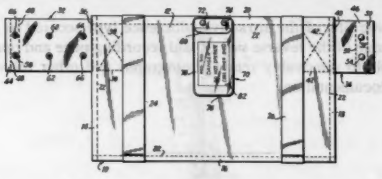
1. A tag, comprising: (a) a pair of plate cover members having marginal flanges securing said cover members together and an identification member sandwiched between said cover members, one of said cover members being transparent so that material on a face of said identification member can be read therethrough, and the other cover member being formed of translucent material and having retroreflective facets to reflect light from the face thereof,

(b) said identification member being formed of rigid plastic material and said face thereof being prepared so it can be written upon and said face having a value no lower than 7, according to the Munsell System, so that dark writing thereon can be read through said transparent cover member,

(c) said cover members being formed of reddish material and forming together a three-dimensional heart shape and said cover members having at the top of the heart shape a slot formed therein in which said identification member is positioned with an outer portion extending outside of said heart shape having an opening therein for securing said indentification member to another object to tag the same, the dimensions of said slot being approximately the same as the cross-sectional dimensions of said identification member, and

(d) said cover members having means forming parallel walls therebetween on opposite sides of said slot guiding said identification member as it is inserted in said slot, at least portions of sides of said identification member being undercut so as to be inwardly flexible and said portions of said sides being formed as latches camming inwardly as said identification member is inserted through said slot and said parallel walls having coacting latching recesses and said latches latching in said recesses against removal of said indentification member from said slot whereby said identification member is secured once it is inserted into said slot.

4,215,498
SAFETY TAGGING DEVICE
James G. Wilson, 28 Donna Dr., Albany, N.Y. 12205
Filed Oct. 26, 1978, Ser. No. 954,905
Int. Cl.[3] G09F *3/14*
U.S. Cl. 40—21 R **9 Claims**



1. In a safety tagging device for the particularly secure and conspicuous mounting and display of a mark-up tag from a riser pole or like structural support member attendant the de-energization of power transmission and distribution circuits and the like which are supported from said riser pole, the improvements comprising, a main body portion of generally quadrangular configuration, said main body portion being sized to present a surface area at least five times greater than that of said mark-up tag, and to be wrappable generally around said riser pole, said main body portion being of a highly durable and visible material, a mark-up tag holder comprising a generally envelope-like member of a substantially waterproof and transparent material which is attached to said main body portion for the protected, yet readily visible, mounting and display of a mark-up tag on said main body portion, and attachment means for securely, yet readily removeably, attaching said main body portion to said riser pole, said attachment means comprising bands of a generally elasticized material attached to opposite sides of said main body portion and extending therefrom, and closure means affixed to said attachment bands and operable to securely, yet readily removeably, secure the same together to attach said main body portion to said riser pole by wrapping said safety tagging device thereabout whereby, said mark-up tag will be securely and conspicuously displayed and called to the attention of anyone attempting to re-energize said circuit to prevent the premature re-energization thereof.

4,215,499
COLLECTOR'S DEVICE
Harlan R. Wilson, P.O. Box 53025, Oklahoma City, Okla. 73105
Filed Jul. 10, 1978, Ser. No. 922,833
Int. Cl.[2] G09F *1/10*
U.S. Cl. 40—158 R **2 Claims**

1. A device for collecting and display of memorabilia, comprising:

a recording page having first and reverse sides, said first side receiving printed entry of time, place, event and particular relevant data, said first side also including a designated area for receiving addendum matter in affixure thereto;

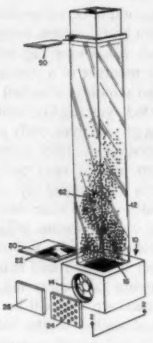
a transparent, generally thin, plastic enclosure that is unitarily formed and having at least two sides parallel, and having an access hole formed generally centrally on one parallel side for receiving memorabilia matter;

tape means of similar area to said one parallel side and having adhesive on each side thereof, for securing said one

parallel side to said recording page designated area while sealing said enclosure; and

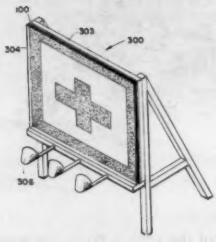
plastic film of the attractive adherence type secured to one edge of the reverse side of said recording page and operable to removably retain photographs and other relevant documentation.

4,215,500
VISUAL DISPLAY DEVICE
Gordon Sharp, 372 Memorial Dr., Cambridge, Mass. 02139
Filed Aug. 15, 1977, Ser. No. 824,920
Int. Cl.[2] G09F *19/00*
U.S. Cl. 40—409 **16 Claims**



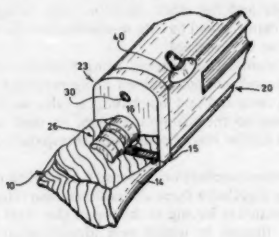
1. A kinetic, visual display apparatus comprising:
means for establishing a pressurized, flowing stream of air;
means for defining a column containing a visually perceivable volume;
a plurality of lightweight expanded plastic beads of generally rounded exterior surface without substantial convolutions, said beads disposed in said volume;
said volume containing first and second openings at the boundary thereof;
said openings being operatively closed by screening having a mesh size small enough to prevent the passage of said beads therethrough;
the first opening in the boundary of said volume being at a lower elevation than the second opening;
the pressurized, flowing stream of air being introduced into said volume through said first opening therein, to agitate and generally float and thereby suspend the beads within said volume, whereby a kinetic, visual display is produced; and
means for projecting illumination into said volume to permit visual perception of said beads.

4,215,501
LIGHT EFFICIENT DISPLAY DEVICE
Leo Meijer, Green Bay, Wis., assignor to Ten-O-One Inc., Green Bay, Wis.
Filed Dec. 21, 1977, Ser. No. 862,927
Int. Cl.[2] G09F *13/02, 13/04, 13/16*
U.S. Cl. 40—559 **4 Claims**



1. A light efficient display device comprising;
(a) a translucent substrate having a front and a rear surface said substrate having optical properties such that approximately one half of the light incident on one of the surfaces of the substrate will be reflected from that surface and approximately one half of the light incident on that one surface will be transmitted through the substrate and will be emitted from the other surface,
(b) indicia formed on the front surface of the substrate
(c) said indicia being a substantially opaque and non-reflective coating and
(d) whereby there is a contrast between the indicia and the uncoated portion of the substrate and said contrast remains constant whether the light is incident upon the front surface or is incident upon the rear surface if the incident light is constant in both cases.

4,215,502
MUZZLE-LOADING FIREARM
Carl K. Loven, Cheshire, Conn., assignor to Loven Firearms Company, Brookfield, Conn.
Filed Aug. 17, 1978, Ser. No. 934,769
Int. Cl.[2] F41C *1/00, 700*
U.S. Cl. 42—61 **8 Claims**



1. A firearm comprising:
a stock having a barrel end face, a generally longitudinally-extending primary bore formed therein and opening onto said barrel end face, and at least one generally transversely-extending internally-threaded ancillary bore formed therein one end of which opens onto said primary bore and the other end of which opens onto a lateral face of said stock;
a double barrel having a barrel end plate and a bolt secured to said barrel end plate having an annular groove, said bolt being demountably and rotatably received within said

primary bore with said groove thereof being positioned such that it opposes said ancillary bore;

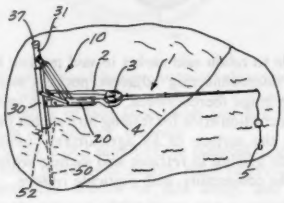
at least one set screw threadably receivable in said ancillary bore having an inner end which is configured and dimensioned to permit substantially mating engagement thereof with said annular groove, so as to retain said bolt in said primary bore while permitting rotation thereof and, in turn, said double barrel.

4,215,503

AUTOMATIC HOOK SETTING APPARATUS

Floyd C. Hiner, Rte. 4, Box 105, Fairbury, Nebr.

Filed Feb. 21, 1979, Ser. No. 13,739
Int. Cl.[3] A01K *91/06*
U.S. Cl. 43—15 **10 Claims**



7. An automatic hook setting device for use in conjunction with a fishing rod having a reel, line and hook connected thereto, wherein the hook setting device comprises:

upper and lower tubular members mounted for relative reciprocation and enclosing a compression spring,

a trigger mechanism releasably controlling said compression spring,

a rod holder pivotally connected to said upper and lower tubular members and said trigger mechanism, wherein

said trigger mechanism can release said compression spring, to force said upper tubular member vertically away from said lower tubular member, and pivot said rod holder in an upward arc.

4,215,504

LINE GUIDE FOR A FISHING ROD

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo K.K., Japan

Filed Jul. 3, 1978, Ser. No. 921,712
Claims priority, application Japan, Jul. 7, 1977, 52-89932[U]
Int. Cl.[2] A01K *87/04*
U.S. Cl. 43—24 **4 Claims**

1. A line guide for a fishing rod, comprising:

(a) A guide ring defining a path for the line; and

(b) A supporting frame including

(1) a jacketing ring mounting said guide ring therein, and

(2) a plurality of legs having feet structurally adapted to be secured to the rod, two of said legs diverging radially of the rod from a single one of said feet, and extending past opposite sides of the centerline of said guide ring for a radial distance that exceeds the distance between said single one of said feet and the part of the jacketing ring most remote from said single one of said feet, and thence downwardly radially to said jacketing ring and joined thereto.

4,215,505

CABLE HARDWARE

Walter J. Henze, North Wildwood, N.J., and William Purcell, Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.

Filed May 7, 1979, Ser. No. 36,366
Int. Cl.[3] A01K *91/06*
U.S. Cl. 43—27.4 **4 Claims**

1. In cable hardware for use with trolling apparatus for fishing, an apparatus to prevent kinking of the line which extends through an opening in a bushing comprising

a hollow sleeve carried by the line and having one end thereof of larger cross section than the opening in said bushing,

said sleeve having an opening therethrough from which the line extends at one end,

a connector within said opening at the other end of said sleeve to which said line is connected,

said connector including a loop of larger size than said opening for attachment of tackle, and

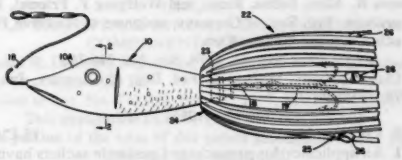
a pin mounted transversely at said other end of said sleeve, for engagement through said loop for preventing disengagement of said loop from said sleeve.

4,215,506

TROLLING LURE AND METHOD OF MAKING SAME

Kenneth P. LeBoeuf, P.O. Box 78, Schriever, La. 70395

Filed Apr. 2, 1979, Ser. No. 25,868
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.05 **8 Claims**



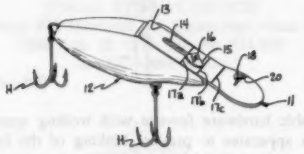
1. A trolling fishing lure comprising:

(a) a molded plastic transparent fish-like body having a fish head at one end and two annular wire tie grooves at its other end,

(b) leader wire opening means extending longitudinally through said body, reflective spectra film secured to said

body so that when viewed from the outside of said body to resemble fish-like scales,
(c) trolling weights in the bottom of said body,
(d) an outer skirt of thin plastic mirror film sheeting slit to provide a plurality of streamers wrapped clockwise about said body about said wire tie grooves,
(e) an inner skirt of thin plastic mirror film sheeting slit to provide a plurality of streamers some of which are wider in width than others,
(f) said inner skirt being wrapped counter clockwise over and about said outer skirt,
(g) squid tip means proximate the free ends of the wider streamers of said inner skirt, and
(h) both said inner and outer skirts being secured to said fish-like body by a length of wire passed about said skirts twisted upon itself and retaining said skirts between said wire and said annular wire tie grooves on said fish-like body.

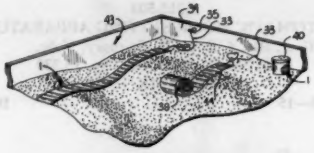
4,215,507
ADJUSTABLE FISHING LURE BILL
Harry J. Russell, 3009 School St., Rockford, Ill. 61103
Filed Jul. 20, 1978, Ser. No. 926,531
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.22 **2 Claims**



1. A fishing lure of the floating and diving type comprising; a lure body, an adjustable fishing lure bill, a grooved out flat surface on the uppermost front end surface of the lure body, said grooved out flat surface being of the same thickness, width, and length as an upper rectangular shaped portion of the lure bill providing means for adjustably mounting said adjustable fishing lure bill, said grooved out flat surface being bounded by a pair of perpendicular side walls for laterally guiding the longitudinally traveling adjustable fishing lure bill, said upper rectangular shaped portion having a slot for receiving a means for locking the adjustable fishing lure bill in a selected adjusted position, the lure bill further having a lower rounded end portion and an eye screw mounted in the central portion of said lower rounded end portion, said eye screw having a split ring attached thereto for attachment of the lure to a fishing line.

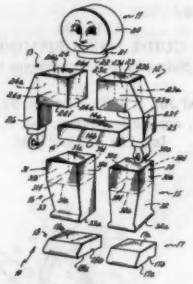
4,215,508
APPARATUS AND METHOD FOR FUMIGATING STORED AGRICULTURAL COMMODITIES
James R. Allen, Salina, Kans., and Wolfgang F. Friemel, Heppenheim, Fed. Rep. of Germany, assignors to Research Products Company, Salina, Kans.
Filed Sep. 28, 1978, Ser. No. 946,766
Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 7818669[U]
Int. Cl.² A01M *13/00*
U.S. Cl. 43—125 **15 Claims**

1. An applicator for prepackaged pesticide sachets having a porous envelope with a moisture activated pesticide therein, said applicator comprising:
(a) an elongate flexible, porous, non-hygroscopic strip of matted adhered fibers having first and second overlying plies interconnected along one side edge thereof; and
(b) a plurality of seams extending laterally across said plies and interconnecting the same; said seams forming a plurality of pockets therebetween shaped for receiving and retaining the sachets therein; each of said pockets having a closed end disposed at the one side edge of the plies, a pair of substantially parallel side edges formed by adjacently disposed seams, and an open end located at the other side edges of the plies; said pocket open end being shaped to receive one of said sachets therethrough, and



closable to retain said sachet in said pocket; each of said seams interconnecting adjacent pockets and forming a flexible hinge therebetween, along which said applicator folds accordion-style for folding up a sachet filled applicator on the surface of an agricultural commodity after pesticide gassing to retrieve said sachets without adulterating the commodity with pesticide residue.

4,215,509
ANIMATED TOY BLOCK SET
James F. Mariol, Cincinnati, Ohio, assignor to Design Alliance, Inc., Cincinnati, Ohio
Filed Jul. 10, 1978, Ser. No. 923,176
Int. Cl.² A63H *33/00*
U.S. Cl. 46—22 **7 Claims**

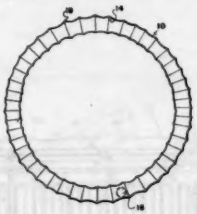


1. An animated toy block set capable of being assembled into multiple different positions of an animal character utilizing the same combination of blocks but in multiple different relative positions to effect the different positions of the animal character, said set comprising
at least three blocks,
at least two of said three blocks having a portion of the body and an appendage of the animal character integrally formed thereon,
said body portion of said two blocks being shaped as a cube, from which said appendage extends, and
said blocks being adapted to rest in an assembled relation forming the complete animal character and being adapted to be altered in position relative to one another to vary the position of the animal character.

4,215,510
FLEXIBLE HOLLOW HOOP AND BALL

Knolly Worrell, 117-15 226th St., Cambria Heights, N.Y. 11411

Filed Jun. 26, 1978, Ser. No. 918,934
Int. Cl.[2] A63H *1/32, 5/00*
U.S. Cl. 46—47 2 Claims



1. A hoop comprising a hollow hoop of substantially circular cross section, wherein a ball is mounted in a central cavity of the hollow interior of said hoop, with said ball of a size to freely move in said interior, wherein

the hoop is made of a semi-flexible material, and wherein

the hoop has a plurality of internal ridge rings running laterally about the interior of said hoop, and projecting towards the interior of the hoop, and in which

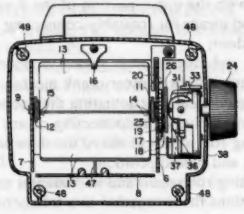
the hoop is formed with a plurality of external ridge rings on the exterior of the hoop, that project outwardly from the hoop,

said hoop being of a size to fit substantially snugly about the waist of a wearer, such that a wearer may cause said ball to rotate in the interior of the hoop, with respect to said hoop, by body motion of the wearer, with said external ridge rings serving to limit rotatable motion of the hoop with respect to the wearer while each said internal ridge rings produces a clicking noise when the ball rotates about the interior of said hoop, striking a said internal ridge ring.

4,215,511
TOY TELEVISION SET WITH MUSICAL BOX

Masatoshi Todokoro, 2-33, Koganehara 2-chome, Matsudo-shi, Chiba-ken, Japan

Filed Aug. 11, 1978, Ser. No. 932,763
Int. Cl.[2] A63H *5/00*; G09F *11/06, 11/04*
U.S. Cl. 46—175 R 4 Claims



1. A toy television set with a musical box, comprising in combination:

(a) a case modeled after the cabinet of a television set;

(b) a transparent rectangular screen at the front side of said case;

(c) a horizontal shaft disposed in the case in alignment with a line extending across the center of the screen and parallel thereto;

(d) a music box in said cabinet with a rotary drum;

(e) a prime mover coupled for driving said shaft and said drum;

(f) a pair of discs at both ends of said shaft, each of said discs being formed with a plurality of apertures along the periphery thereof;

(g) a plurality of substantially identically sized radially disposed display rectangular leaves, each of which is sized to about one-half of said screen and contains on both sides thereof matter to simulate one-half of a television scene so that the back of one leaf and the front of the next leaf provide one full scene, each leaf having a defined inner end;

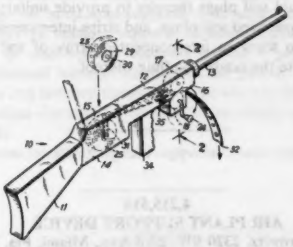
(h) insert elements extending from both sides of said inner ends, said elements being inserted into corresponding disc apertures; and,

(i) a clutch plate disposed at one end of said horizontal shaft, said prime mover being a windup spring prime mover, and a central driving shaft, a driving plate with pawls engaged with said clutch plate secured to one end of said driving shaft, a grip extending outside said case coupled to said prime mover windup spring for winding up said spring by turning said grip.

4,215,512
HARMLESS SONIC TOY

Stanley J. Philipson, 1161 York Ave., New York, N.Y. 10021

Filed Mar. 23, 1979, Ser. No. 23,162
Int. Cl.[3] A63H *5/00*
U.S. Cl. 46—195 5 Claims



1. A harmless sonic toy device comprising, in combination, a frame member, a cylindrical idler roll mounted for rotation on said frame member, a cylindrical drive roll mounted for rotation on said frame member, said drive and idler rolls having their axes of rotation disposed in parallel spaced relation and having peripheral portions disposed in proximate spaced relation to define a nip, means for rotating said drive roll and an elongate strip of air impervious stretchable plastic film disposed in driving connection in the nip between said rolls, said strip including a plurality of longitudinally spaced-apart sealed air containing pockets, the thickness of said pockets exceeding the spacing of said rolls at said nip whereby rotation of said drive roll progressively advances said strip through said nip and consequently bursts said pockets.

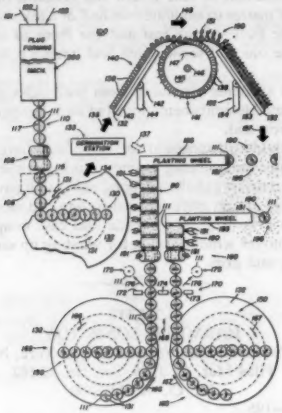
4,215,513
FIELD TRANSPLANT SYSTEMS AND METHODS AND COMPONENTS THEREOF

Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Division of Ser. No. 772,094, Feb. 25, 1977, Pat. No. 4,130,072.
This application Jul. 28, 1978, Ser. No. 928,902
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—56 23 Claims

1. An interconnected array of polymerized soil plugs comprising a plurality of bodies of spongy open-celled hydrophilic polymer, a quantity of particles of soil mix distributed throughout said bodies of spongy polymer, a quantity of foam-forming synthetic organic plastic resin being reacted in situ to form said

bodies of spongy open-celled hydrophilic polymer binding said particles of soil mix therein and into cohesive soil plugs, said soil mix comprising from about 20% to about 80% by dry



weight of said soil plugs thereby to provide unitary self-supporting polymerized soil plugs, and strips interconnecting said soil plugs to form an interconnected array of soil plugs to accommodate the ready handling thereof.

4,215,514

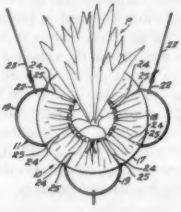
AIR PLANT SUPPORT DEVICE

Alvin E. Horowitz, 2320 SW. 23rd Ave., Miami, Fla. 33145

Filed Oct. 10, 1978, Ser. No. 949,902

Int. Cl.[2] **A01G** *31/00, 9/02*

U.S. Cl. 47—67 **2 Claims**



1. An air plant support device comprising in combination, a substantially flat frame member, said frame member comprising a continuous length of bent wire, a quantity of sphagnum moss secured to each side of said frame member and defining together a generally circular mass of sphagnum moss, said frame member having a plurality of bent wire loops extending outwardly of the periphery of said sphagnum moss mass, said outwardly extending loop portions comprising means for interhooking engagement therewith of support members for hangingly supporting the air plant support device, said mass of sphagnum moss being substantially enclosed in a previous fabric sack, said sack having a central opening at one side of said frame member and draw-string means for tightening the opening of said sack against the sphagnum moss secured to said one side of said frame member.

4,215,515

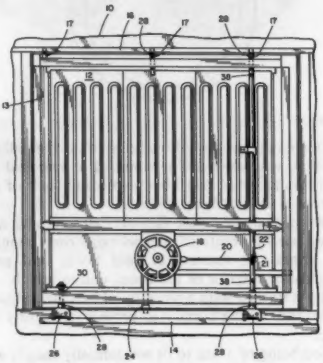
PLUG DOOR ACTUATING MECHANISM

Harold E. Hesch, St. John, Ind.; Harold A. Wold, New Buffalo, Mich., and Leonard F. LeMaire, Chicago, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Jul. 20, 1978, Ser. No. 926,182

Int. Cl.[2] **B61D** *19/00;* **E05C** *3/04;* **E05D** *15/10*

U.S. Cl. 49—218 **5 Claims**



1. A railway car having a sliding door arranged to move laterally between an open and closed position and having a door operating mechanism for locking and or securing the door, the improvement comprising;

a bottom support rail;

a top guide rail;

wheel means mounted on said support rail;

door guide means associated with the top guide rail for guiding the top portion of the door for opening and closing;

lower crank means with means connecting the wheel means with the lower portion of said door;

upper crank means with means connecting the door guide means with the upper portion of the door;

adapter rod means for rotatably connecting the crank means to said door;

operating rod means with means connecting one upper crank means with a lower crank means;

hand operated means for actuating the door operating mechanism and including a connecting means for rotating the operating rod means to move the door laterally between an open and closed position;

said operating rod means and said adapter rod means having end portions fitted together in a telescoping connection;

said telescoping connection having an opening extending therethrough;

connector means positioned in the opening;

said connector means having one end larger than the opening and having a second, smaller end;

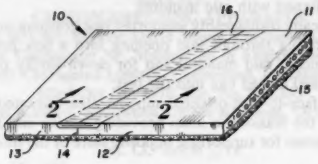
said operating rod means being spaced a given distance from said door, said given distance being shorter than the length of the connector means to prevent removal of the connector means when the door is closed and

said operating rod means comprising means for rotatably positioning the larger end of the connector means said given distance from the door when the door is in the closed position.

4,215,516
UNIDIRECTIONAL TAPE

Robert J. Huschle, and Sidney J. Roberts, both of Dennison, Minn., assignors to Sheldahl, Inc., Northfield, Minn.

Continuation of Ser. No. 849,270, Nov. 7, 1977, abandoned, which is a continuation of Ser. No. 732,100, Oct. 13, 1976, abandoned. This application Apr. 18, 1979, Ser. No. 31,180
Int. Cl.[2] B24D *11/06*
U.S. Cl. 51—399 **1 Claim**



1. An endless flexible abrasive belt comprising a parallelogram strip of a woven backing sheet spliced to an endless belt along a butt joint formed therein and having opposed major surfaces with a coating of abrasive grit applied to one of said major surfaces and with a splicing means secured to the other of said major surface and spanning said butt joint, said splicing means comprising:

(a) a fiber reinforced composite strip member consisting of a cohesive member bonded to said major surface and having a multiplicity of fibers spanning said butt joint, said fibers being disposed generally parallel, one to another, and with the fibers of said strip member having their axes oriented generally parallel to the central axis of said endless belt and being free of transverse fibers;

(b) each of said fibers being a polymer of poly-p-benzamide and the polyterephthalamide of p-phenylenediamine and having a tensile modulus of about 200 grams per denier, with said fibers being arranged at a quantity of 40 fibers per inch perpendicular to the measured direction;

(c) said fibers being laminated to a polyester adhesive; and

(d) said fiber-adhesive having a backing member bonded thereto, said backing member consisting essentially of a film of stress-oriented polyethylene terephthalate having a thickness of 1 mil.

4,215,517
AUXILLIARY WINDOW FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS

William Everson, Perkasie, Pa., assignor to Perkasie Industries Corporation, Perkasie, Pa.

Continuation of Ser. No. 789,554, Apr. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 687,878, May 18, 1976, Pat. No. 4,121,379. This application Jun. 12, 1978, Ser. No. 914,854
Int. Cl.[2] E06B *3/28*
U.S. Cl. 52—202 **5 Claims**

1. An auxiliary or storm window closure for primary window frames having diverse, transverse, and longitudinal dimensions, said closure comprising:

a plurality of parallel, rectangular, transparent panels;

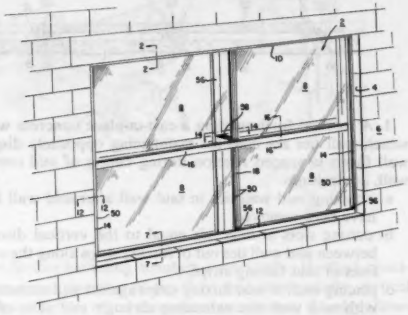
a plurality of elongated panel edge moldings having longitudinal slots which engage the edges of said panels, said moldings being positioned on the sides and along the lengthwise edges of said panels;

said moldings including a longitudinal base with a longitudinal portion thereof defining the bottom of each slot, walls extending from said base to define the sides of each slot;

gaskets positioned adjacent one of said walls to prevent infiltration of air around said panels and through said prime window frames;

a plurality of horizontal supports adjoining vertically adjacent panels along their length to form a sheet, a plurality of said sheets being provided;

each of said horizontal supports having a generally flat, longitudinal surface adapted to be placed across said frame and fastened thereto between vertically adjacent panels and having a gasket receiving slot with an opening facing vertically for receiving a vertically adjacent panel and a gasket;



a gasket positioned in each gasket receiving slot to sealingly engage the horizontal supports to an adjacent panel;

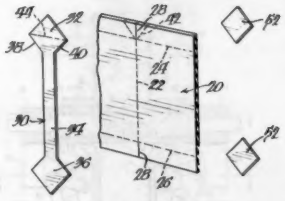
a plurality of vertical supports adjoining adjacent sheets, each of said vertical supports having a generally flat, longitudinal surface adapted to be placed across said frame and fastened thereto between said sheets and having a vertical slot with an opening for receiving said adjacent sheets;

and means for attaching said supports to said window frame.

4,215,518
FLANGED CORNER CONSTRUCTION AND METHOD

W. Roscoe Blair, Charleston, S.C., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Jul. 3, 1978, Ser. No. 921,553
Int. Cl.[2] F16L *25/00*
U.S. Cl. 52—658 **15 Claims**



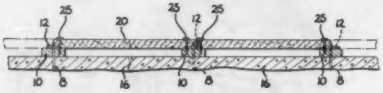
1. A corner construction having a flange extending around at least one end of the corner, said corner construction comprising a strip of flexible, essentially flat material having at least one edge, said edge being bent over relative to said strip to define a flange, said strip being bent lengthwise in the form of a corner, a separation in said flange at said corner defining a space in said flange beyond said corner, an insert made of essentially flat flexible material, said insert substantially corresponding to the dimensions of said space at said separation, and means for securing said insert to said flange in said space, said insert having a portion extending around and secured to the juncture at said flange and corner.

4,215,519

METHOD FOR CAST-IN-PLACE CONCRETE WALLS

Kenneth K. Koch, Blue Springs, Mo., assignor to International Housing Limited, Westport, Conn.

Filed Dec. 15, 1978, Ser. No. 970,000
Int. Cl.[2] E04B 1/41
U.S. Cl. 52—741 **9 Claims**



1. A method for insulating a cast-in-place concrete wall in which wall ties are used for maintaining oppositely disposed wall forms in spaced relation during curing of said concrete wall, comprising:

a. retaining said wall ties in said wall after said wall forms have been removed;

b. cutting slots at intervals equal to the vertical distances between said wall ties out of furring strips along the center lines of said furring strips;

c. placing each of said furring strips against said cement wall with said wall ties extending through said slots of said furring strip;

d. driving a fastening member into the exposed part of the aperture of each of said wall ties which extends beyond said furring strip so that said furring strip is pressed tightly against and anchored to said cement wall;

e. affixing said fastening member which has been driven into said aperture of said wall tie to said furring strip;

f. placing insulation panels over said furring strips; and

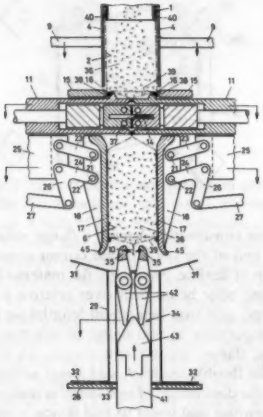
g. affixing said insulation panels to said furring strips.

4,215,520

APPARATUS FOR MAKING, FILLING, CLOSING AND BOXING BAGS

Hans Heinzer, Beringen, and Werner Müller, Neuhausen am Rheinfall, both of Switzerland, assignors to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rhienfall, Switzerland

Filed Nov. 9, 1978, Ser. No. 959,226
Claims priority, application Switzerland, Nov. 9, 1977, 13667/77
Int. Cl.[2] B65B 9/08, 43/42
U.S. Cl. 53—173 **7 Claims**



1. In an apparatus for making, filling, closing and boxing bags including a vertically oriented hollow mandrel about which a hose of sealable sheet is continuously formed, means for cyclically providing a transverse seam on the hose; and cutting means for cyclically severing the hose at the transverse seam for providing precedingly filled, sealed bags; the improvement comprising

(a) a base plate situated underneath said mandrel for supporting serially positioned and advanced, upright-oriented bag-receiving boxes open at their top and bottom;

(b) means defining an opening provided in said base plate and aligned with said mandrel;

(c) vertically displaceably supported bag grasping means for penetrating through said opening into a box positioned underneath said mandrel and for downwardly pulling a filled and closed bag into the box;

(d) two face-to-face oriented support plates situated underneath the transverse seam-providing means and the cutting means for supporting opposite sides of the filled bags; and

(e) means for vertically displacing in unison said support plates, said transverse seam-providing means and said cutting means and for horizontally displacing said support plates towards and away from one another; the means for vertically and horizontally displacing each support plate including

(1) a vertically displaceable carriage;

(2) a parallelogram linkage connecting each said support plate to the respective carriage to provide for the vertical displacement of each said support plate; and

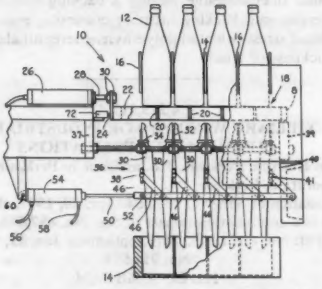
(3) actuating means connected to the linkage to provide for the horizontal displacement of each said support plate.

4,215,521

ARTICLE RETARDING DEVICE FOR CASE LOADING MACHINE

Thomas S. Hartness, Rte. 12, Paris Mtn., Greenville, S.C.

Filed Sep. 7, 1978, Ser. No. 940,373
Int. Cl.[2] B65B 21/16
U.S. Cl. 53—248 **5 Claims**



2. An article retarding device for use with a grid set for breaking the fall of articles as they are dropped through said grid set into a case, said grid set including a trip-bar assembly onto which said articles are fed, means for shifting said trip-bar assembly for dropping said articles towards said case carried therebelow, a plurality of pivotally supported downwardly extending fingers carried in the form of a matrix below said trip-bar assembly, said downwardly extending fingers being arranged so that there is a finger in each corner of a passage through which said articles drop when being loaded into said case, said article retarding device comprising:

cam means carried adjacent said fingers;

means for placing said cam means in a first position in engagement with said fingers forcing said fingers diagonally towards the center of said respective passages wherein

four equally spaced fingers engage said article for stopping the downward movement of said articles as said articles are dropped through said passages when said trip-bar assembly is shifted; and

means for retracting said cam means to a second position allowing said fingers to be retracted back into the corners of said passages permitting said articles to drop into said case.

4,215,522

CARTON ERECTING APPARATUS

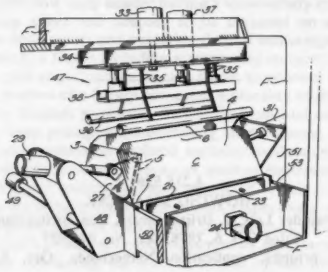
Gunther K. Clift, Tiptree; David Young, Chelmsford, and Brian S. Fix, Goldhanger Nr. Maldon, all of England, assignors to Cundell Corrugated Limited, Chelmsford, England

Filed Oct. 10, 1978, Ser. No. 950,165

Claims priority, application United Kingdom, Oct. 11, 1977, 42272/77

Int. Cl.[2] B65B *7/18*

U.S. Cl. 53—378 **11 Claims**



1. Apparatus for closing knock-down cartons of the type having, at each end thereof in continuation of each other, two oppositely disposed side wall flaps and two oppositely disposed end wall flaps having crease lines defining triangular portions to provide gussets, the apparatus comprising a pair of oppositely disposed carton side gripping devices each having a resiliently mounted gripping plate supported for movement towards and away from said carton side, a pair of oppositely disposed triangular pressure plates each hingedly mounted on a support, each support also having mounted thereon means for angularly moving the respective one of said triangular pressure plates into engagement with said triangular portions of said end wall flaps to partially fold inwardly said end wall flaps and said side wall flaps, a pair of pressure rods fixedly spaced apart movable in unison linearly into engagement with said partially folded-in side wall flaps to further fold inwardly said side and end flaps so that the free ends of said side flaps are in overlapping engagement, and a pressure bar movable relative to and in the same direction as said pressure rods and between said pressure rods while said pressure rods continue to engage said side wall flaps into engagement with said overlapping free ends of said side flaps along a previously applied line of adhesive.

4,215,523

PACKING MACHINE

Arthur G. Turner, 27 York St., Norwich NR2 2 AN, England

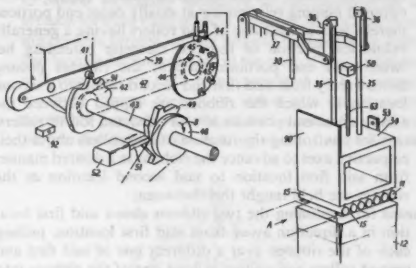
Filed Jan. 22, 1979, Ser. No. 5,395

Claims priority, application United Kingdom, Jan. 24, 1978, 2852/78

Int. Cl.[3] B65B *57/10, 5/10*

U.S. Cl. 53—496 **15 Claims**

1. A packing machine for objects comprising a pair of pivoted vertically movable flaps which, in one position in use, define a horizontal platform, means for forming on the platform a horizontal array of the objects, a vertically movable plunger which includes a member having a horizontal surface which is operatively associated, in use, with the upper surface of the array objects, means for sensing the formation of a complete array of objects on the platform and thereupon initiating downward movement of the plunger, support means for the flaps carried by the plunger and being movable vertically therewith during its initial downward movement, the support



means further including members connected to the flaps operative to cause pivoting of the flaps to a substantially vertical position after the initial downward movement, thereby allowing the array of objects to move past the flaps, the plunger being so arranged that during the movement of the flaps the said horizontal surface moves down close to, or in contact with, the upper surface of the horizontal array.

4,215,524

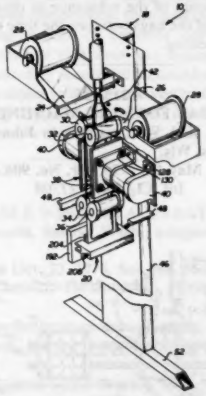
MEMBRANE PACKAGING MACHINE

R. Glenn Saylor, West Covina, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 29, 1979, Ser. No. 7,362

Int. Cl.[2] B65B *9/02*

U.S. Cl. 53—554 **17 Claims**



1. Apparatus for packaging a substance in closed bags formed from two continuous ribbons of a thin, fragile material comprising:

first and second rollers directed along a first horizontal plane and circumferentially engageable in opposed nipping relationship at axially outer end portions thereof to confine two ribbons therebetween, at least one of said rollers having a generally smooth annular concave portion extending between said end portions, the two ribbons approaching said first and second rollers generally horizontally from opposite sides thereof with each of the ribbons

passing over and partially around one of said rollers to a first location between said rollers, whereupon the ribbons are brought face to face with one another and nipped in that condition between the axially outer end portions of said first and second rollers;

third and fourth rollers directed along a second horizontal plane and spaced beneath said first and second rollers, said third and fourth rollers circumferentially engageable in opposed nipping relationship at axially outer end portions thereof with at least one of said rollers having a generally cylindrical portion of reduced diameter extending between said end portions thereof, the ribbons passing downwardly from said first and second rollers to a second location at which the ribbons are nipped between the axially outer end portions of said third and fourth rollers;

means for controlling the rotation of said rollers about their respective axes to advance the ribbons in a desired manner from said first location to said second location as the ribbons are held taught therebetween;

means for tensioning the two ribbons above said first location in a direction away from said first location, pulling each of the ribbons over a different one of said first and second rollers and pulling at least one of the ribbons into said at least one concave portion to preform the unsealed combination of the ribbons at said first location and for a substantial distance therebelow into a generally tubular shape;

means for sealing the ribbons to each other as the ribbons pass from said first location to said second location, forming a bag open at the top from a portion of the ribbons and subsequently sealing said top to close the bag after the ribbons have advanced a downwardly predetermined distance, said sealing means operating on successive portions of the ribbons as the ribbons advance toward said second location to form a series of sealed bags; and

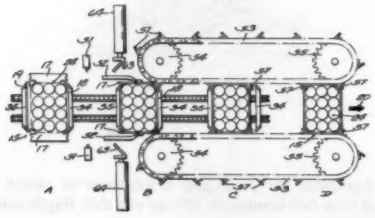
means for introducing a substance directly into each of the open bags, comprising a conduit extending downwardly between said first and second rollers in the space formed by said at least one concave portion, said conduit located between and generally spaced from the preformed ribbons to prevent damage thereto, and means for causing a predetermined amount of the substance to pass from said conduit to each of the bags between the time of bag formation and that of sealing.

4,215,525

TRAY FORMING MACHINE

Biagio J. Nigrelli, Kiel, Wis., assignor to Johns-Nigrelli-Johns, Sheboygan Falls, Wis.

Filed May 16, 1978, Ser. No. 906,497
Int. Cl.[2] B65B *11/08*
U.S. Cl. 53—580 **2 Claims**



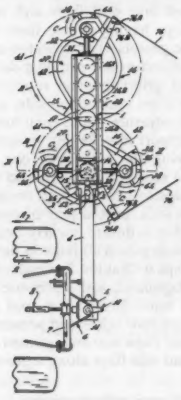
1. Apparatus for forming a tray blank into a tray about its contents, said tray blank having a central rectangular panel, leading and trailing flaps and side flaps, said flaps having foldable end tabs which are interconnected in oblique superimposed relation when the tray blank is formed into a tray with beveled corners, with the end tabs of said side flaps having marginal notches and said apparatus comprising side flap folders, leading and trailing tray flap folders comprising cross bars having at their ends fixed obliquely bent fingers, said cross bars being connected to endless conveying means beneath said blanks, and cam means to move said cross bars upwardly and fold upwardly said leading and trailing end flaps, and wherein said bent fingers engaging and bending obliquely the end tabs on the leading and trailing tray flaps, an adhesive applicator for applying adhesive to said leading and trailing flap end tabs, and side conveyors having folding clips which project into the conveying path and engage the end tabs on the side flaps and fold them against the end tabs on the leading and trailing tray flaps in the course of conveyor advance, with the notches in the side flap end tabs registering and interfitting with said oblique fingers to provide clearance therebetween, and said engaged folding clips moving in concert with the tray for an interval to insure setting of the adhesive to secure the flaps in assembly, and said cam means releasing said cross bars from engagement with the leading flap, with said notches enabling removal of the oblique fingers from the contacting position with the end tabs while the end tabs are held in assembly by said folding clips.

4,215,526

MOWING MACHINE

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Oct. 6, 1978, Ser. No. 949,037
Claims priority, application Netherlands, Oct. 6, 1977, 7710954
Int. Cl.[2] A01D *35/264, 53/00, 35/00*
U.S. Cl. 56—12.7 **48 Claims**

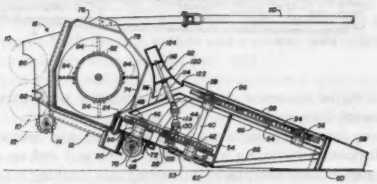


1. A mowing machine comprising a rotor including means for mowing cut crop which is mounted for rotation at a first rpm about a substantially vertical main axis, a mowing element mounted on said rotor for rotation at a second rpm higher than said first rpm about a substantially vertical further axis which is spaced from said main axis, said rotor including a plate which is disposed beneath said mowing element, a first part of the periphery of said plate being arcuate and spaced outward of said further axis by a first distance, a second part of the periphery of said plate also being arcuate and spaced outward of said main axis by a second distance which is longer than said first distance.

4,215,527
MULTI-ROW CROP HEADER WITH FEED ASSIST ROLLER

Joe E. Shriver, East Earl, and Curtis H. Lindblom, New Holland, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Jan. 31, 1979, Ser. No. 8,143
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—98 5 Claims



1. A multi-row crop header having a transversely extending converging auger and adapted to be mounted on a forage harvester for support and operation thereof and comprising in combination, a frame including a transverse support member adjacent said auger, means on said frame to connect it to the forward portion of a forage harvester, a plurality of forwardly extending dividers projecting forwardly from said auger and defining crop passageways extending therebetween and upwardly and rearwardly inclined surfaces to slidably engage down crops as said header advances, pairs of endless cooperating feeding and gathering chains supported by said frame and having substantially parallel segments respectively disposed along opposite sides of each of said passageways, crop cutters adjacent each passageway and supported by said frame, means adjustably connecting the innermost ends of said dividers to said transverse support member of said frame to permit said dividers to be adjusted transversely relative to each other to adapt the same to harvest row crops in which the rows are evenly spaced different distances from other rows of crops, and means to connect said cutters and chains commonly to power means on said forage harvester for operation thereof in association with said converging auger to receive cut row crops from said passageways between said dividers and consolidate the same; the improvement consisting of rotary feed assist means comprising an elongated roller mounted adjacent the inner end of the outermost divider for rotation about an axis fixed relative to said inner end of the outermost divider and having surfaces merging generally with the contours of said divider and extending generally upwardly and rearwardly therefrom to engage and guide down crops from the inner end of said outermost divider to said auger for said consolidation of said cut crop material, and means connected to said roller and driven relative to said chains to rotate said roller toward said passageway to move said down crops into said auger and thereby prevent hairpinning of said down crops.

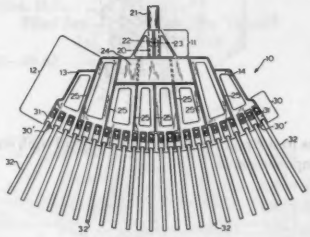
4,215,528
RAKE

William G. Fodor, Blairs, Va., assignor to Sandvik, Inc., Greensboro, N.C.

Filed Jul. 9, 1979, Ser. No. 55,705
Int. Cl.[3] A01D *7/00*
U.S. Cl. 56—400.17 2 Claims

1. A lawn rake comprising, in combination:

(a) a tine receiving rake head molded of a plastic material as an integral unitary structure having a handle engaging portion and a tine mounting portion molded integrally as a single structure, said handle engaging portion including a generally centrally located elongated longitudinally extending socket portion for receiving therein one end of a handle, said tine mounting portion extending transversely from said socket portion and having an arcuate forward edge portion, rib formations separated by openings through said tine mounting portion and formed on both top and bottom sides of said tine mounting portion, said rib formations being tapered from a maximum thickness adjacent the said handle socket portion to a minimum thickness adjacent said arcuate forward edge portion with strength and rigidity being maintained in the area of the handle socket portion enabling said tine mounting portion to exhibit increasing flexibility in the direction of said arcuate forward edge portion, laterally spaced tine receiving pockets formed on said arcuate forward edge portion and having thickness added in the area of tine securement, said tine pockets each being provided with a camming structure formed therein on either side on an opening accessible from the outside of said arcuate forward edge portion for detachably securing ends of respective tines



therein locked in one position being accessible to a tool such as a screwdriver whereby such secured ends may be flexed to another position and withdrawn for easy removal and replacement of damaged tines therefrom;

(b) a handle rigidly secured in said pocket portion; and

(c) a plurality of individual tines removably spaced transversely along said arcuate forward edge portion in said tine pockets and extending outwardly therefrom, each of said tines being of universal configuration and adapted to fit in any of said tine pockets, each said tine at its mounted end including a pair of opposite outwardly opening notches adapted to ride over and engage said camming means to removably secure the mounted end of said tine in said pocket subject to being removed by being flexed over said camming means by a said tool inserted through said opening.

4,215,529
CABLE WINDING APPARATUS

Osceola J. Gerbracht, Seattle, Wash., assignor to Norfin, Inc., Seattle, Wash.

Filed Oct. 23, 1978, Ser. No. 953,363
Int. Cl.[2] H01B *13/00, 13/06*
U.S. Cl. 57—6 6 Claims

1. An apparatus for producing a composite cable from linear conductive strands having a thermoplastic coating thereon, comprising:

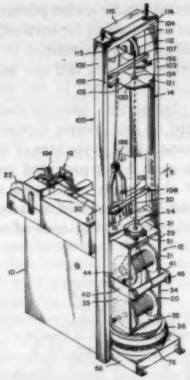
a rotatably mounted spool housing including a plurality of mounting means for rotatably mounting spools of the thermoplastic coated strands;

pulling means for pulling strands from spools mounted in the spool housing;

collimating means including a fairlead mounted in the spool housing along the axis of rotation of the housing, the collimating means positioned to draw together strands pulled from the spools by the pulling means.

power means for rotating the spool housing such that a plurality of strands pulled from spools in the rotating spool housing by said pulling means will be twisted about one another, and;

heating means for heating the thermoplastic coatings of the twisted strands as the the strands pass from the collimating



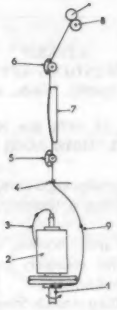
means to the pulling means so as to bond such strands into a composite cable.

4,215,530

PROCESS AND APPARATUS FOR MANUFACTURING A DRAWN AND TWISTED MULTIFILAMENT SYNTHETIC YARN

Patrick Beau, Largentiere, and Carlos M. Gabalda, Granges-les-Valence, both of France, assignors to ASA S.A., Roanne, France

Filed Jan. 9, 1979, Ser. No. 2,237
Claims priority, application France, Jan. 13, 1976, 78 01437
Int. Cl.[3] D01H *1/10, 7/86;* D02J *1/22*
U.S. Cl. 57—310 **10 Claims**



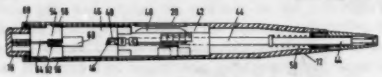
6. Apparatus for use in manufacturing a drawn and twisted multifilament synthetic yarn from an extruded and partially drawn filamentary synthetic yarn, the device comprising a double twist spindle for simultaneously twisting and drawing the extruded partially drawn yarn, two spaced apart feeders to maintain the yarn under controlled tension, a unit located between the feeders for heating the yarn, and a yarn wind-up means downstream of the feeders.

4,215,531

WATCHES

Hon W. Wong, Ting Kau, New Territories, Hong Kong

Continuation-in-part of Ser. No. 727,494, Sep. 28, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,832
Int. Cl.[2] G04B *37/00*
U.S. Cl. 368—10 **12 Claims**



1. A digital electronic watch in combination with a writing instrument comprising:

means for dispensing a marking material, said means for dispensing including a dispenser at one end and an elongated storage receptacle for storing said marking material extending rearwardly from said dispenser, said dispenser adapted to be extended for writing and retracted for storage;

a hollow elongated casing having a tapered end and an open end, said tapered end having said means for dispensing attached thereto with said elongated storage receptacle axially disposed inside said casing, said casing further having an insert compartment formed therein, said insert compartment extending a predetermined distance into said casing from said open end, and a window disposed between said predetermined distance and said open end;

digital watch insert means disposed in said insert compartment for generating a visual time display through said window, said watch insert means having an axial passageway permitting said elongated storage receptacle to pass partway therethrough and a mechanical means disposed at the end of said axial passageway, said mechanical means engaging the end of said elongated storage receptacle and operative to extend and retract said dispenser; and

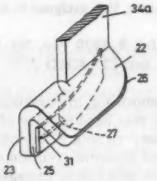
cap means disposed to close the open end of said casing, said cap means including a mechanical actuator coupled to said mechanical means, actuation of said mechanical actuator operative to cause said mechanical means to extend and retract said means for dispensing.

4,215,532

MECHANICAL WATCH MOVEMENT

Frieddrich Perrot, Lengnau, Switzerland, assignor to Eta A. G. Ebauches-Fabrik, Grenchen, Switzerland

Continuation of Ser. No. 748,182, Dec. 7, 1976, Pat. No. 4,157,008. This application Nov. 21, 1978, Ser. No. 962,667
Claims priority, application Switzerland, Dec. 12, 1975, 16170/75
The portion of the term of this patent subsequent to Jun. 5, 1996, has been disclaimed.
Int. Cl.[2] G04B *17/00*
U.S. Cl. 368—168 **1 Claim**



1. In a mechanical watch movement in which a balance-cock supports a balance arranged to pivot in bearings about a fixed axis, and a balance spring is fixed at its inner end to said balance

and at its outer end to a bent arm of a thin, blanked plate-like support member detachable from the remainder of the said movement, the improvement wherein said bent arm terminates in a one-piece substantially planar lower end section which comprises:

a first substantially planar section which extends parallel to the balance axis;

a second substantially planar section connected directly at its upper end to and extending downwardly and radially outwardly from the lower end of the first section, said second section comprising a first part transversely coextensive with the first section and a second part extending transversely from the first part; and

a third substantially planar section connected directly at its upper end to, being transversely coextensive with, and extending downwardly from the upper end of the second part of the second section, said third section being coplanar with said first section;

said third section and said second part of said second section defining an imperforate downwardly and radially outwardly opening V-shaped groove therebetween;

the outer end of said balance spring being in said groove; and

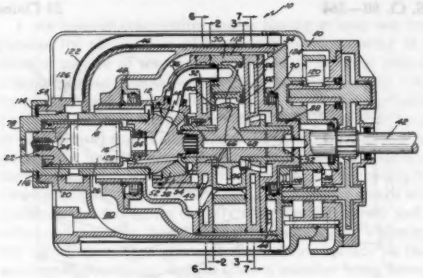
a mass of cement at least partially filling said groove and securing the outer end of said balance spring to said lower end section of said bent arm.

4,215,533

ROTARY EXPANDER ENGINE

Giovanni J. Silvestri, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1976, Ser. No. 720,313
Int. Cl.[3] F02B 53/06
U.S. Cl. 60—39.63 **12 Claims**



1. A rotary expander engine using a working fluid for propulsion comprising:

a housing member;

a combustion chamber secured in said housing member and having a first end and a second end;

an inlet valve having a stationary male part being connected to said combustion chamber at the first end thereof and having an inlet passage acting as a delivery point for the working fluid and a rotatable female part rotatably mounted on said male part and having two inlet passages acting as delivery points therein, the male part and the female part thereof being mounted on a block;

a housing chamber being rotatably mounted in said housing and rotatable at a first speed relative to said housing and being in communication with the rotatable female part of said inlet valve;

a rotatable multi-lobed rotor rotatably mounted in said housing chamber, said rotor being rotatable at a second speed relative to said housing member and thus being able to have a second rotational speed relative to said housing chamber, said housing chamber and said rotor forming a plurality of working spaces of changing volumes;

a stationary crank shaft being mounted in said housing;

an output shaft being mounted in said housing and secured to said housing chamber;

a coolant for cooling said housing chamber, said rotor and said output shaft by circulating said coolant therethrough;

means for lubricating said housing chamber, said rotor and said output shaft; and

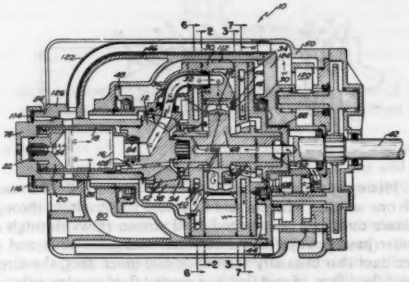
exhaust means for rejecting the exhaust gases and the outflowing coolant.

4,215,534

COOLING SYSTEM FOR AN EXPANDER ENGINE

Giovanni J. Silvestri, Barrington, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1976, Ser. No. 720,485
Int. Cl.[3] F02B 53/06
U.S. Cl. 60—39.63 **8 Claims**



1. In a rotary expander engine having a fixed housing with a stationary crankshaft, a housing chamber rotatable at a first speed, a rotor rotatable at a second speed and inlet valve having a stationary male part and rotatable female part being mounted in said fixed housing, O-rings for preventing gases from leaking from said housing chamber, and an improved cooling system which comprises:

a source of coolant being mounted in the support structure of said rotary expander engine;

a pair of generally parallel coolant flow path means for coolant to flow from the hottest points of said engine to the coolest points thereof; and

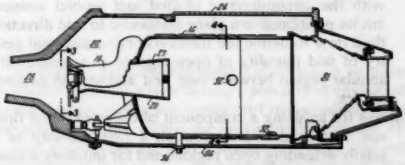
means for controlling the velocity of the coolant and the temperature distribution inside said housing chamber.

4,215,535

METHOD AND APPARATUS FOR REDUCING NITROUS OXIDE EMISSIONS FROM COMBUSTORS

George D. Lewis, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jan. 19, 1978, Ser. No. 870,788
Int. Cl.[2] F02C 7/22
U.S. Cl. 60—736 **6 Claims**



1. A combustor structure having a combustion zone includ-

ing a central portion and a radially outward portion encased by a cylindrical body, and having a fuel and air mixing zone upstream thereof which includes a main fuel and air mixing tube surrounded by a plurality of pilot fuel and air mixing tubes wherein said main tube has a convergent section at the upstream end thereof and a divergent section at the downstream end thereof and includes means for circumferentially swirling effluent dischargeable therefrom into the central portion of the combustion zone and wherein said pilot tubes are so oriented as to cause effluent dischargeable therefrom to swirl circumferentially about the radially outward portion of the combustion zone.

4,215,536

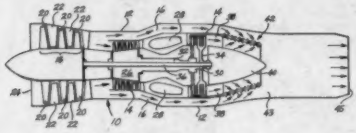
GAS TURBINE MIXER APPARATUS

Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 773,530, Mar. 2, 1977, Pat. No. 4,165,609. This application Dec. 26, 1978, Ser. No. 973,166

Int. Cl.[2] **F02K** *1/02*

U.S. Cl. 60—262 **9 Claims**



1. Mixing apparatus for mixing first and second fluid streams with one another wherein said first fluid stream flows through an inner duct and said second fluid stream flows through an annular passageway formed between said inner duct and an outer duct that coaxially surrounds said inner duct, the direction of fluid flow of said first and second fluid streams substantially being in the same axial direction relative to said coaxially arranged inner and outer duct extending axially in the direction of fluid flow beyond the terminus of said inner duct to define a common duct for the mixing of said first and second fluid streams, said mixing apparatus comprising:

an annular free mixer mountable to said terminus of said inner duct to extend in said axial direction of fluid flow, said annular free mixer having a cross-sectional geometry at the forwardmost end thereof substantially corresponding to the cross-sectional geometry of said terminus of said inner duct, said annular free mixer having a smoothly contoured terminating edge for permitting those regions in said first and second fluid streams flowing contiguous with the boundaries of said free mixer to partially mix with one another as said contiguous regions flow past said terminating edge of said free mixer; a plurality of relatively thin elongate plates, each of said plates being substantially rectangular in geometry and having first and second longitudinal edges, said plates being mounted to extend rearwardly from circumferentially spaced apart positions along said terminating edge of said annular free mixer to define a plurality of axially extending open regions with each of said plates forming a boundary wall that separates one of said open regions from an adjacent one of said open regions, said first and second longitudinal edges of each of said plates being respectively intersecting with the circumference of first and second concentric circles positioned in a plane transverse to said direction of fluid flow to define the transverse cross-sectional geometry of said plurality of open regions as segments of the annular region between said first and second concentric circles;

means for inducing a component of outward radial flow of said first fluid stream through a first plurality of said axially extending open regions and for inducing a component of inward radial flow of said second fluid stream through a second plurality of said axially extending open regions, said radially induced flow of said first fluid stream penetrating into said second fluid stream and said radially induced flow of said second fluid stream penetrating into said first fluid stream, individual open regions of said first plurality of open regions for outward radial flow of said first fluid stream being interspersed in circumferential alternation with individual open regions of said second plurality of open regions for inward radial flow of said second fluid stream, said means for inducing said radial flow of said first and second fluid streams including a first and second plurality of deflection vanes respectively mounted within individual open regions of said first and second pluralities of axially extending open regions to extend between adjacent ones of said circumferentially spaced-apart, axially extending plates, said deflection vanes being spaced-apart from one another along said axially extending plates and canted relative to the axial flow direction of said first and second fluid streams, said deflection vanes being canted to expose the forwardmost boundary of each of said deflection vanes with that one of said first and second fluid streams being induced to include a radial flow component, each individual deflection vane of said first and second pluralities of deflection vanes being contoured relative to the direction transverse to said direction of fluid flow to position the surface of each of said deflection vanes coincident with an arc of a circle that is concentric with said first and second concentric circles.

4,215,537

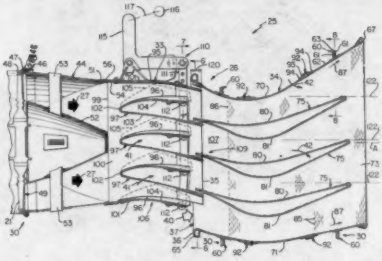
APPARATUS FOR AND METHOD OF SUPPRESSING INFRARED RADIATION EMITTED FROM GAS TURBINE ENGINE

John F. Hurley, Easton, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Jul. 27, 1978, Ser. No. 928,446

Int. Cl.[3] **F02C** *7/18;* **F02K** *1/26*

U.S. Cl. 60—264 **23 Claims**



1. In an apparatus for suppressing infrared radiation emitted from hot metal parts at the aft end of a gas turbine engine and from the exhaust gas plume thereof during engine operation comprising:

a dual purpose ejector vane assembly operatively associated with said engine for introducing cooling ambient air into the hot engine exhaust gases and hiding said hot metal parts and means supporting said vane assembly in operative association with said engine wherein said vane assembly further comprises:

a tubular duct structure for receiving and confining said engine exhaust gases consisting of two cooperating portions defined by an upstream portion and a downstream portion, said upstream portion having a discharge end of a particular area, said downstream portion having an inlet end provided with an inlet area which is larger than said particular area to define an annular space therebetween for receiving additional cooling ambient air therethrough by ejector action during said engine operation; and

at least one tubular vane constructed in said downstream

portion providing at least one stream of cooling ambient air completely across said downstream portion to mix with the exhaust gases confined thereby, said tubular vane being constructed of a single thickness metal sheet which has aligned slits therein defining air jets which cooperate to emit by ejector action the stream of cooling ambient air.

4,215,538

INTERNAL COMBUSTION ENGINE HAVING AN AFTERBURNING DEVICE

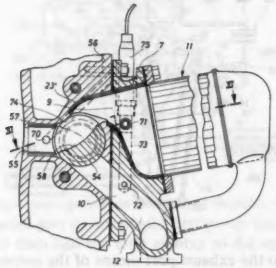
Johannes Steinwart, Obersulm-Willsbach; Konrad Lummerzheim, Neckargartach; Armin Bauder, Neckarsulm, and Gottlieb Wilmers, Neuenstadt, all of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,283

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731098

Int. Cl.[2] F01N *3/15*

U.S. Cl. 60—276 **14 Claims**



1. An internal combustion engine having at least one outlet passage for the exhaust of burned gases, terminating at the exterior surface of the engine and capable of being placed in communication alternatively with an afterburner and with a by-pass by-passing the afterburner, a temperature regulated control member passing the burned gases through the by-pass at high temperature and through the afterburner at low temperature, a housing being arranged on the exterior surface of the engine in the region of the outlet passage, the housing have two openings in its surface adjacent to the engine, one of which openings communicates directly with the afterburner and the other opening with the by-pass, the outlet passage widening in the direction of flow towards the exterior surface so that it encloses the openings, and the control member being arranged pivotally in the outlet passage so that it connects the outlet passage exclusively with the one opening in its first position and exclusively with the other opening in its second position.

4,215,539

EXHAUST GAS PURIFYING APPARATUS FOR AUTOMOBILE MULTI-CYLINDER ENGINE

Kazuyuki Tanaka, and Tatsuro Oda, both of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Mar. 28, 1978, Ser. No. 891,111

Claims priority, application Japan, Apr. 11, 1977, 52/41635

Int. Cl.[2] F01N *3/15*; F02M *25/06*

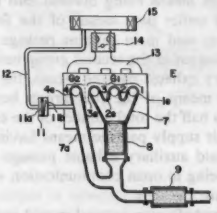
U.S. Cl. 60—278 **7 Claims**

1. An exhaust gas purifying apparatus for use in an automotive vehicle engine of a type having a plurality of engine cylinders each having intake and outlet port means connected to a combustion chamber within the corresponding engine cylinder, the outlet port means of the respective engine cylinders exhausting exhaust gases to the outside of the engine subsequent to combustion of air-fuel mixtures which have been introduced into the associated combustion chambers of the engine cylinders, said exhaust gas purifying apparatus comprising:

a main exhaust passage means having a reducing catalyst therein and having an oxidizing catalyst therein downstream at the reducing catalyst;

an auxiliary exhaust passage means connected to the main exhaust passage means only between the reducing catalyst and the oxidizing catalyst;

said outlet port means being divided into first and second groups, the outlet port means of the first group being connected to said main exhaust passage means and the outlet port means of the second group being connected to



said auxiliary exhaust passage means, the number of said outlet port means of the first group being greater than half the total number of the engine cylinders;

a secondary air supply passage means having one end connected to said auxiliary exhaust passage means and the other end being in open communication with a source of secondary air;

a pressure operated valve disposed in said secondary air supply passage means for controlling the supply of secondary air by opening in response to the pulsating flow of the exhaust gases flowing through said auxiliary exhaust passage means.

4,215,540

EXHAUST GAS PURIFYING APPARATUS FOR AUTOMOBILE MULTI-CYLINDER ENGINE

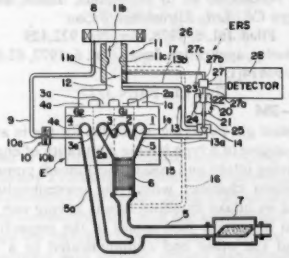
Kazuo Kobayashi; Tadataka Nakazumi; Tatsuro Oda, and Kazuyuki Tanaka, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jun. 20, 1978, Ser. No. 917,353

Claims priority, application Japan, Jun. 29, 1977, 52-86793[U]

Int. Cl.[3] F01N *3/15*; F02M *25/06*

U.S. Cl. 60—278 **8 Claims**



1. An exhaust gas purifying apparatus for use in an automotive vehicle engine of a type having a plurality of engine cylinders each having intake and outlet port means connected to a combustion chamber within the corresponding engine cylinder, said engine having intake manifold means, said intake manifold means having one end connected to said intake port means of respective engine cylinders and the other end in open

communication with atmosphere through a carburator mounted thereon, said carburator having a throttle valve for controlling the flow of air-fuel mixture to said cylinders, the outlet port means of the respective engine cylinders exhausting exhaust gases to the outside of the engine subsequent to combustion of the air-fuel mixtures which have been introduced into the associated combustion chambers of the engine cylinders, said exhaust gas purifying apparatus comprising:

a main exhaust passage means having a reducing catalyst therein and having an oxidizing catalyst therein downstream of the reducing catalyst;

an auxiliary exhaust passage means between the reducing catalyst and the oxidizing catalyst;

said outlet port means being divided into first and second groups, the outlet port means of the first group being connected to said main exhaust passage means and the outlet port means of the second group being connected to said auxiliary exhaust passage means, the number of said outlet port means of the first group being equal to or greater than half the total number of the engine cylinders;

a secondary air supply passage means having one end connected to said auxiliary exhaust passage means and the other end being in open communication with a source of secondary air;

a pressure operated valve located in said secondary air supply passage means, said exhaust gases which flow in said auxiliary exhaust passage means flowing in a pulsating flow and said pressure operated valve being opened and closed in response to said pulsating flow in said auxiliary exhaust passage means for admitting and closing off a flow of secondary air into said secondary air supply passage means; and

exhaust gas recirculating passage means, one end of said intake manifold means being divided into a plurality of intake ducts which are connected to respective intake port means of respective engine cylinders, one end of said recirculating passage means being connected to said intake manifold means downstream from said throttle valve and upstream of said intake ducts and downstream of said throttle valve on said carburator, and the other end of said exhaust gas recirculating passage means being connected to said main exhaust passage means upstream of said connection of said main exhaust passage means and said auxiliary exhaust passage means for redirecting a flow of said exhaust gases back into all of said cylinders.

4,215,541

DUAL-CATALYST EXHAUST GAS PURIFYING APPARATUS FOR MULTI-CYLINDER ENGINE

Kazuyuki Tanaka; Kazuo Kobayashi; Tatsuro Oda, and Tadataka Nakazumi, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 6, 1978, Ser. No. 922,429

Claims priority, application Japan, Jul. 6, 1977, 52-81287; Jul. 15, 1977, 52-94614[U]

Int. Cl.² F01N *3/15*

U.S. Cl. 60—284 **8 Claims**

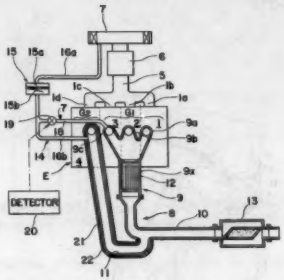
1. An exhaust gas purifying apparatus for use in an automotive vehicle engine of a type having a plurality of engine cylinders each having intake and exhaust port means communicated to a combustion chamber within the corresponding engine cylinder, and an intake manifold means having one end communicated to the intake port means of the respective engine cylinders and the other end communicated to a source of air-fuel mixture, the exhaust port means of the respective engine cylinders exhausting exhaust gases to the outside of the engine subsequent to combustion of air-fuel mixture which has been introduced from the air-fuel mixture source into the associated combustion chambers of the engine cylinders, the exhaust port means being divided into first and second groups, the number of the exhaust port means of the first group being equal to or greater than half the total number of the engine cylinders, said exhaust gas purifying apparatus comprising, in combination:

a reducing catalyst unit;

an oxidizing catalyst unit;

a first exhaust manifold means including a collecting duct means, communicated to the exhaust port means of the first group, said reducing catalyst unit being housed in position within the collecting duct means to allow the exhaust gases emitted from the exhaust port means of the first group to pass through said reducing catalyst unit, and an exhaust passage means having one end, communicated to the reducing catalyst unit, and the other end communicated to the atmosphere, said oxidizing catalyst unit being housed within the exhaust passage means and positioned downstream of the reducing catalyst unit with respect to the direction of flow of the exhaust gases from the exhaust port means of the first group towards the atmosphere;

a second exhaust manifold means having one end communicated to the exhaust port means of the second group and the other end communicated to the exhaust passage means at a position upstream of the oxidizing catalyst unit;



a first secondary air supply passage means having one end communicated to said second exhaust manifold means and the other end communicated to a source of secondary air, said first secondary air supply passage means including a first pressure operated valve disposed on said first secondary air supply passage means for supplying a secondary air by the utilization of a pulsating flow of the exhaust gases flowing through said second exhaust manifold means;

a second secondary air supply passage means having one end communicated to the collecting duct means at a position upstream of the reducing catalyst unit; and

a switching valve means operable to permit the flow of the secondary air into the collecting duct means through the second secondary air supply passage means only during a predetermined period of time in which the oxidizing catalyst unit is cool.

4,215,542

EXHAUST GAS PURIFYING APPARATUS FOR AUTOMOBILE MULTI-CYLINDER ENGINE

Kazuo Kobayashi; Tatsuro Oda; Tadataka Nakazumi, and Kazuyuki Tanaka, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 11, 1978, Ser. No. 933,041

Claims priority, application Japan, Aug. 18, 1977, 52-110855[U]

Int. Cl.² F01N *3/15, 3/10*

U.S. Cl. 60—290 **8 Claims**

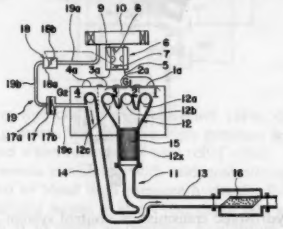
1. An exhaust gas purifying apparatus for use in an automotive vehicle engine of a type which has a plurality of engine cylinders each having intake and outlet port means connected to a combustion chamber within the corresponding engine cylinder, the intake port means having an intake manifold connected thereto and the outlet port means of the respective

engine cylinders being for exhausting exhaust gases to the outside of the engine subsequent to combustion of air-fuel mixtures which have been introduced into the associated combustion chambers of the engine cylinders through said intake port means, said exhaust gas purifying apparatus comprising:

a main exhaust passage means connected to specified ones of said outlet port means and having a reducing catalyst and a three-way catalyst disposed at the downstream side with respect to the reducing catalyst with respect to the direction of flow of the exhaust gases from the engine cylinders towards the outside of the engine;

an auxiliary exhaust passage means connected to a portion of said main exhaust passage means between said reducing catalyst and said three-way catalyst;

said outlet port means being divided into first and second groups, the outlet port means of the first group having said main exhaust passage means connected thereto and said outlet port means of the second group having said auxiliary exhaust passage means connected thereto, the number of said outlet port means of said first group being equal to or greater than half the total number of the engine cylinders;



a secondary air supply passage means having one end connected to said auxiliary exhaust passage means and the other end in in communication with a source of secondary air;

a pressure operated valve disposed in said secondary air supply passage means for allowing supplying a secondary air by utilizing a pulsating flow of the exhaust gases flowing through said auxiliary exhaust passage means; and

a control valve disposed at the upstream side of said pressure operated valve on said secondary air supply passage means for regulating the rate of flow of the secondary air through said secondary air supply passage means in response to changes in the magnitude of the engine operating parameters.

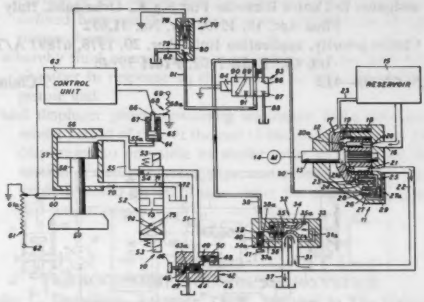
4,215,543

METHOD AND APPARATUS FOR LINEAR AND NONLINEAR CONTROL OF A HYDRAULIC PRESS

John C. Miller, Algoma, Wis., assignor to C. A. Lawton Company, Depere, Wis.

Filed Apr. 9, 1979, Ser. No. 28,225
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—327 **14 Claims**

1. An apparatus for operating a hydraulic press having a control unit controlling a first pressure relief valve connected to a reservoir and a directional valve selectively movable to a first position to connect said first pressure relief valve to a second pressure relief valve which is connected to a hydraulic pump having an output connected to said press, said second pressure relief valve connected to said output to divert pressure from said output in selected amounts regulated by said first pressure relief valve over a cycle of operation.

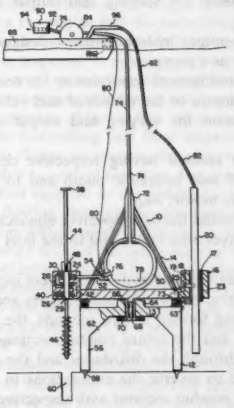


4,215,544

METHOD OF GENERATING ROTARY POWER IN A DEEPSEA ENVIRONMENT

Tad Stanwick, 4715 Upton St. N.W., Washington, D.C. 20016

Filed May 17, 1978, Ser. No. 907,062
Int. Cl.[2] B63G *8/00*
U.S. Cl. 60—398 **9 Claims**



1. Method of generating deepsea rotary power comprising:

A. Supporting a rotatable turbine and sphere in communicating relationship, said sphere being evacuated of water and in open communication with the atmosphere at a surface location via attached flexible conduit means;

B. Submerging said turbine, sphere and attached conduit means at a deepsea working depth;

C. Admitting water at the working depth through said turbine and into said sphere, so as to drive the turbine, and

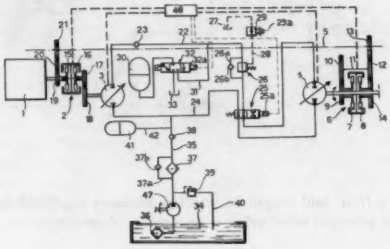
D. After water admitted to said sphere has risen to the surface through said conduit, maintaining water flow utilizing pumping means attached to said conduit at said surface location.

4,215,545

HYDRAULIC SYSTEM FOR TRANSMITTING POWER FROM AN INTERNAL COMBUSTION ENGINE TO THE WHEELS OF A MOTOR VEHICLE

Lorenzo Morello, and Pier G. Castelli, both of Turin, Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Apr. 19, 1979, Ser. No. 31,692
Claims priority, application Italy, Apr. 20, 1978, 67897 A/78
Int. Cl.[2] F15B *1/02;* F16H *39/46*
U.S. Cl. 60—413 7 Claims



1. In an hydraulic system for transmitting power from an internal combustion engine to the wheels of a motor vehicle having:

a variable-output, reversible hydraulic pump,

a first mechanical transmission for connecting said internal combustion engine to said hydraulic pump,

control means for varying said output of said hydraulic pump,

a variable-output hydraulic motor designed to be used reversibly as a pump,

a second mechanical transmission for connecting said hydraulic motor to the wheels of said vehicle,

control means for varying said output of said hydraulic motor,

a delivery conduit having respective connections to the outlet of said hydraulic pump and to the inlet of said hydraulic motor, and

a return conduit having respective connections to the outlet of said hydraulic motor and to the inlet of said hydraulic pump,

improvements in said hydraulic system including:

a two-position distributor, said delivery and return conduits each being formed in two sections, the delivery conduit sections and the return conduit sections being interconnected through the distributor and the distributor being arranged to reverse the connections to interconnect the delivery conduit sections with respective said return conduit sections,

a duct, having a connection to said delivery conduit,

an hydraulic accumulator, having a connection to said duct for accumulating kinetic energy normally dissipated in the engine during deceleration of said vehicle,

control means for said hydraulic distributor for reversing the said connections during deceleration of the vehicle so that the hydraulic motor acts as a pump to deliver hydraulic fluid to the hydraulic accumulator,

a first friction clutch inserted in said first mechanical transmission, and

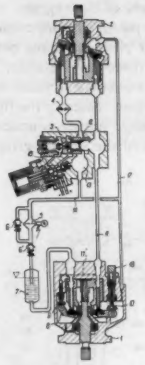
control means for disengaging said first friction clutch when energy accumulated in said hydraulic accumulator is fed to said hydraulic motor.

4,215,546

HYDROSTATIC TRANSMISSION CONTROL SYSTEM

Aleksander Hager; Ryszard Zajaczkowski, and Andrzej Adamowicz, all of Wroclaw, Poland, assignors to Kombinat Typowych Elementow Hydrauliki Silowej "Pszl-Hydral", Bierutowska, Poland

Filed Aug. 24, 1978, Ser. No. 936,916
Claims priority, application Poland, Aug. 27, 1977, 200526
Int. Cl.[2] F15B *21/04*
U.S. Cl. 60—456 2 Claims



1. A hydrostatic transmission control system comprising:

a. a variable displacement pump including an input line, an output pressure line, a swash plate and swash plate positioning means, said swash plate positioning means comprising a servo piston located in a cavity connected to said output pressure line, and a pusher having biasing means acting on said swash plate in response to the output pressure of the pump,

b. a fluid motor driven by the output from the variable displacement pump, said motor including a return line;

c. valve means controlling the output pressure of the variable displacement pump and thereby the swash plate positioning means, said valve means including a two-position control valve assembly with a pilot-actuated relief valve disposed between said output line and said return line from the motor, said swash plate positioning means being actuated by said biasing means to return to initial position of minimum pump output upon drop in said output pressure line produced by jamming of said motor and actuation of said control valve assembly;

d. a cooler in said return line between the motor and said valve means;

e. a reservoir connected to the return line of the motor and the input line of the pump; and

f. a filter unit comprising a clogging indicator connected in said return line of the motor between said valve means and said reservoir, check valve means connected in said return line for bypassing the flow of fluid through said filter in the event of clogging of said filter and for blocking return of fluid from the reservoir.

4,215,547

HYDROSTATIC SYSTEM WITH OVER CONTROL COMPENSATION

Lloyd A. Molby, Longview, Tex., assignor to ATP Inc., Longview, Tex.

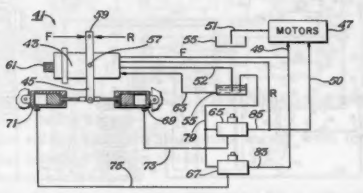
Filed Oct. 11, 1978, Ser. No. 950,404
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—465 8 Claims

1. In a hydrostatic system for at least one variable displacement pump having an actuating means including an actuating member for varying displacement in at least one direction, a

hydraulically actuatable device operable by fluid from said pump, a hydraulic reservoir, and serially interconnecting supply and return lines, including at least a high pressure fluid power line for supplying high pressure fluid for operating said device in said at least one direction, the improvement comprising:

a. at least one high pressure relief valve connected in communication with said at least one high pressure fluid line for relieving hydraulic pressure greater than a predetermined first pressure;

b. at least one neutralizing means for moving said actuating member back toward its neutral position responsive to hydraulic pressure;



c. neutralizing line connecting said relief valve with said neutralizing means for carrying high pressure hydraulic fluid thereto when relieved by said relief valve;

d. bleed-off means connected with said neutralizing means and adapted to bleed high pressure hydraulic fluid from said neutralizing means to allow restroking said actuating member so as to reach an operable equilibrium position commensurate with nonrelieving operation of said device; and

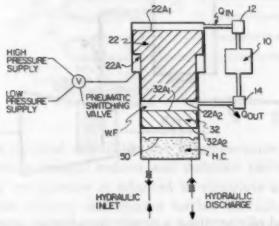
e. bleed-off return line connected serially with said bleed-off means and said hydraulic reservoir for returning hydraulic fluid to said reservoir.

4,215,548

FREE-PISTON REGENERATIVE HOT GAS HYDRAULIC ENGINE

Donald G. Beremand, Bay Village, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 12, 1978, Ser. No. 950,876
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **18 Claims**



1. A free-piston regenerative engine comprising:

a piston chamber including an upper portion, a lower portion and a bottom;

a displacer piston slidably mounted to move through a stroke within said upper portion of said piston chamber, said displacer piston including a top surface area and a bottom surface area;

a heater, a regenerator and a cooler in communication with said piston chamber and being referenced to the top surface area and the bottom surface area of said displacer piston;

means for imparting motion to the displacer piston;

an inertial piston slidably mounted within said piston chamber;

a diaphragm positioned to move through a stroke at a lower portion of said piston chamber wherein a fluid chamber is defined between the diaphragm and said bottom of said piston chamber;

whereby fluid is supplied to and discharged from said fluid chamber in response to the movement of said displacer piston; and

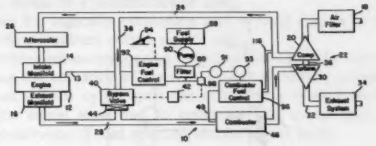
said displacer piston remaining stationary for a predetermined period of time at the end of said stroke to allow the diaphragm to complete its stroke prior to reversing the motion of said displacer piston, and wherein varying said predetermined period of time varies the engine frequency and output power.

4,215,549

TURBOCHARGER COMBUSTOR SYSTEM

John C. Daeschner, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 25, 1977, Ser. No. 855,047
Int. Cl.² F02B *37/00*
U.S. Cl. 60—606 **24 Claims**



1. In an internal combustion engine having a turbocharger driven by exhaust gases to provide compressed charge air for the engine, a combustor system comprising a combustor coupled in-line between the engine and the turbocharger for passage of the exhaust gases; means for controllably supplying fuel to the combustor in response to engine operating conditions including a fuel source, means for pumping fuel from said source, a valve body connected between said pumping means and combustor for passage of fuel, a first valve carried within said valve body for controlling fuel flow therethrough, and means responsive to charge air pressure for adjusting the position of said first valve to control fuel flow; fuel injector means for atomizing the fuel supplied to the combustor using a portion of the gases flowing through the combustor to permit combustor operation with sustained combustion of the fuel to supplement the energy level of the gases passing through the combustor; said fuel injector means including a nozzle having a fuel entrance end and an exit end opening into a combustion chamber formed in said combustor, and a central fuel opening formed in said entrance end, said fuel supply means including a fuel metering tube received through the central opening and extending a short distance into the nozzle interior for directing a stream of fuel into the nozzle entrance end generally along the longitudinal axis of the nozzle, said nozzle having at its entrance end a plurality of axially extending and radially inwardly angled gas jet openings arranged about the central fuel opening and through which a portion of the combustor gas flow passes in the form of gas jets intersecting generally at the fuel stream at the termination of the metering tube to turbulently break up and substantially immediately pick up said stream, and a plurality of tangentially oriented gas swirl openings opening into the nozzle generally radially with respect to the point of intersection of said gas jets for passage of another portion of the combustor gas flow to further break up the fuel stream, whereby the combined gas flow creates a substantially atomized gas-fuel cloud directed into the combustion chamber with axial and circumferential components of velocity; bypass means for controllably bypassing a portion of the charge air flow around the engine to the combustor in response to engine

operating conditions, and for mixing bypassed charge air with exhaust gases upstream of the combustor; and purge means for purging fuel from the combustor and the fuel injector means when fuel supplied to the combustor is interrupted, said purge means including a plenum chamber formed in said valve body and communicating with charge air provided by the turbocharger for storing a quantity of charge air, a check valve for preventing reverse flow of the stored charge air to said turbocharger, and a second valve communicating with fuel supplied to the valve body and with said plenum chamber and operable to release the stored charge air to the combustor and fuel injector means to purge the same when the pressure of fuel supplied to the valve body drops off.

4,215,550

SUPERCHARGED INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATION THEREOF

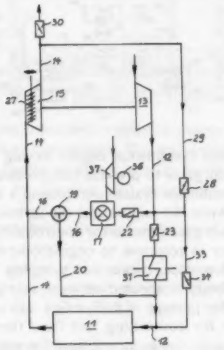
Hans Dinger, and Robert Schulmeister, both of Friedrichshafen, Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 877,031

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706696

Int. Cl.[2] **F02B** *37/00*

U.S. Cl. 60—606 **6 Claims**



1. An internal combustion engine comprising a supercharging means including an exhaust gas turbine means and a charging air compressor means, a charging air line for supplying charging air from the charging air compressor means to the internal combustion engine, a bypass line means for connecting the charging air line with an exhaust gas line, a combustion chamber means disposed in the bypass line means, a return line branching off from said bypass line means at a point located between the combustion chamber means and a connecting place of the bypass line means with the exhaust gas line, said return line terminating in the charging air line, multipath valve means being provided in the bypass line means at the branching off point of the return line for controlling the flow through a portion of the bypass line means and through said return line, wherein the exhaust gas turbine means includes selectively adjustable guide vane means for controlling the flow through the exhaust gas line, and wherein a connecting line means is arranged between the charging air line and the exhaust gas line for recycling exhaust gasses between the exhaust gas line and the charging air line, said connecting line means being connected to the exhaust gas line at a place downstream of the exhaust gas turbine means so as to supply an output of the exhaust gas turbine means to the charging air line, and in that further valve means for controlling the flow through the exhaust gas line is arranged in the exhaust gas line at a place disposed downstream of the connecting place of the connecting line means with the exhaust gas line.

4,215,551

ENVIRONMENTALLY ASSISTED HEATING AND COOLING SYSTEM

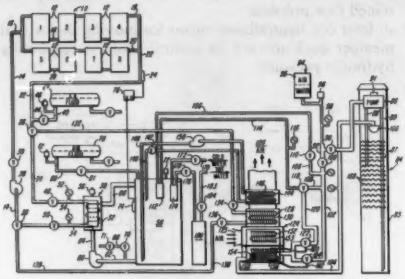
John W. Jones, 2235 Titus Ave., Dayton, Ohio 45414

Division of Ser. No. 807,987, Jun. 20, 1977, Pat. No. 4,158,291.

This application Oct. 12, 1978, Ser. No. 950,796

Int. Cl.[3] **F03G** *7/00;* **F01K** *25/08*

U.S. Cl. 60—643 **1 Claim**



1. In a heating system including a heat engine comprising, in combination, a reservoir of water and means for withdrawing water from said reservoir and placing said water in contact with the evaporation coil of a heat engine, the improvement comprising a casing for said reservoir, an aerator for return of water from contact with said evaporation coil to said reservoir, heat transfer means for exchanging heat between water returned to said reservoir and said casing, said aerator spraying said water upon said heat transfer means.

4,215,552

METHOD FOR THE OPERATION OF A POWER GENERATING ASSEMBLY

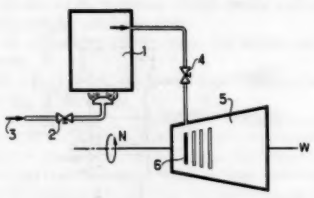
Gilbert Riollet, and Jacques Bruneau, both of Paris, France, assignors to Alsthom-Atlantique, Paris, France

Filed Feb. 1, 1978, Ser. No. 874,172

Claims priority, application France, Feb. 9, 1977, 77 03591

Int. Cl.[2] **F01K** *13/02*

U.S. Cl. 60—646 **7 Claims**

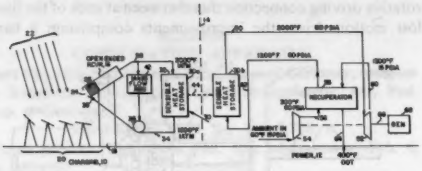


1. A method of operating a power generating assembly, said assembly comprising a steam generator and a turbine, said method comprising the step of controlling the quantity of heat released by the steam generator by a signal which is representative of the difference between the predicted stresses which will exist at the instant *to*+T on that part of the turbine which undergoes the greatest thermal stress as determined by measuring the temperature, pressure and flow rate of steam supplied by said steam generator to said turbine and the maximum permissible stress on this same part at the same instant, where; *to* is the present instant and T is a period of time close to the time constant of the power production assembly.

4,215,553
ENERGY CONVERSION SYSTEM

Armand R. Poirier; Theodore J. Nussdorfer, both of Nashua, N.H., and John H. Stewart, Needham, Mass., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 26, 1978, Ser. No. 918,888
Int. Cl.[3] F02C *1/04*
U.S. Cl. 60—650 **18 Claims**



1. Apparatus for the conversion of solar energy into mechanical energy comprising:

a solar receiver adapted to transfer energy from focused solar radiation to a gas stream;

a Brayton cycle engine;

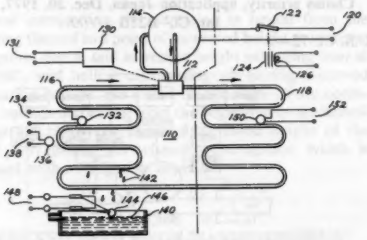
sensible heat storage means that provides a substantially constant exhaust gas temperature during operation; and

means for charging the sensible heat storage means with heated gas from said receiver, and thereafter for discharging said sensible heat storage means so as to transfer stored energy to power the Brayton cycle engine, whereby the Brayton cycle engine is isolated from the solar energy receiver by virtue of the utilization of said sensible heat storage means.

4,215,554
FROST CONTROL SYSTEM

Walter J. Pohl, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 30, 1978, Ser. No. 910,816
Int. Cl.[3] F25D *21/06*; F25B *41/00*
U.S. Cl. 62—156 **10 Claims**



1. Frost control apparatus for a temperature conditioning system which bridges indoor and outdoor environments and wherein a compressor is adapted to circulate a volatile fluid through the system, said system further including indoor and outdoor heat exchange coils exposed to respective ambient conditions and relay means adapted to control the circulation of said fluid;

said apparatus comprising:

first circuit means including respective resistive circuit sections connected at intermediate nodes to form a differential bridge;

means for applying a line voltage across first and second ones of said nodes, said second node being coupled to a reference point;

first and second ones of said circuit sections each having one terminal thereof connected jointly to said second node and having opposite terminals connected to third and fourth nodes respectively;

said first and second circuit sections including first and second sensing elements respectively each having a predetermined temperature coefficient of resistivity, said first and second elements being positioned to sense the temperature of said outdoor coil and of ambient outdoor air respectively;

said first circuit section presenting an effective temperature coefficient of resistivity between said second and third nodes different from that presented by said second circuit section between said second and fourth nodes;

means coupled across said third and fourth nodes for providing a first bi-level signal, said last-recited means being responsive to a first predetermined potential across said nodes to provide a selected voltage level of said first signal, said selected signal level being representative of a temperature differential between said outdoor coil and said ambient outdoor air in excess of a predetermined threshold level, said predetermined threshold level varying with sensed ambient outdoor air temperature;

second circuit means coupled to said reference point;

means responsive to a second predetermined potential derived from said second circuit means for providing a second bi-level signal, a selected voltage level of said second signal being representative of a sensed temperature in excess of a predetermined limit;

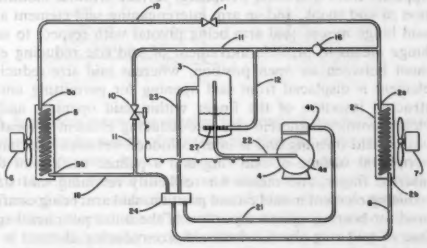
means for logically combining said bi-level signals to provide a resultant output signal; and

switching means responsive to said output signal for controlling the actuation of the relay means to initiate an output coil defrost cycle upon the occurrence of said selected first signal level and to terminate said cycle upon the occurrence of said selected second signal level.

4,215,555
HOT GAS DEFROST SYSTEM

Peter L. Cann, Canastota, and Paul S. Sacks, Cazenovia, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,980
Int. Cl.[2] F25B *13/00, 43/00*
U.S. Cl. 62—324 **6 Claims**



1. An air conditioning system having a refrigeration circuit including a compressor for discharging a flow of heat transfer medium, a first heat exchanger through which the heat transfer medium flows, an expansion device, a second heat exchanger through which the heat transfer medium flows, a fan positioned to circulate air over the second heat exchanger for indirect heat exchange with the heat transfer medium flowing through the second heat exchanger such that ice may accumulate on the exterior surfaces of the second heat exchanger during operation of the air conditioning system which comprises:

an accumulator in fluid communication with an outlet of one of the heat exchangers for receiving the heat transfer medium passed therethrough during heat transfer operation of the refrigeration circuit;

a conduit connected to receive hot gaseous heat transfer

medium from the compressor prior to said medium being passed through either heat exchanger;

means connecting the conduit to the second heat exchanger such that at least a portion of the heat transfer medium passing therethrough is directed to the second heat exchanger to effect defrost of same by condensing the heat transfer medium therein; and

means connecting the conduit to the accumulator such that at least a portion of the hot gaseous heat transfer medium is discharged directly into the accumulator in heat exchange relationship with the heat transfer medium therein to vaporize at least a portion thereof for return to said compressor.

4,215,556

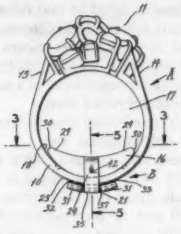
FINGER RING SECUREMENT DEVICE

Joseph A. Mroz, 1800 Deborah Dr., Lemay, Mo. 63125

Filed Nov. 17, 1978, Ser. No. 961,757

Int. Cl.[3] A44C *9/02*

U.S. Cl. 63—15.6 **7 Claims**



1. In combination with a finger ring having an opening for receiving the finger of a wearer, a device for securement of said ring upon the finger, said device comprising a size-reducing element configured for fitting within said opening for interposition between an inner peripheral surface of said opening and a palmar surface of the finger, hinge means for securement to an outer peripheral surface of a shank of the ring opposite from said inner peripheral surface without modification of said shank, and an arm interengaging said element and said hinge means, said arm being pivotal with respect to said hinge means to provide movement of said size reducing element between an open position, wherein said size-reducing element is displaced from said opening for permitting unobstructed insertion of the finger within said opening, and a closed position, wherein said size-reducing element is located within said opening and is interpositioned between said inner peripheral surface of said ring and a palmar surface of the inserted finger, and means for resiliently retaining said size-reducing element in said closed position, said arm being configured for bearing against a portion of the outer peripheral surface of said ring shank when said size-reducing element is in said closed position, said arm presenting said size-reducing element at the distal end of said arm, said size-reducing element being prevented by said arm from being displaced from said closed position by the bearing of said arm against said outer peripheral surface portion of said ring upon attempted movement of said ring along a finger of the wearer in one direction when said ring is upon said finger.

4,215,557

LOCK WITH KEY SLOT MANIPULATION BARRIER

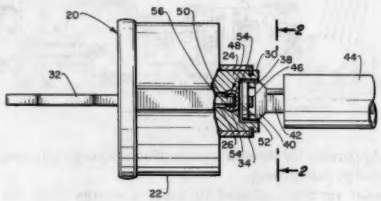
John R. Gerlach, Monterey Park, Calif., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sep. 28, 1978, Ser. No. 946,818

Int. Cl.[2] E05B *63/00*

U.S. Cl. 70—417 **14 Claims**

1. In a lock of the type having a lock cylinder directly rotatably telescoping a lock plug with a parting line directly therebetween and with a key slot totally axially through the lock plug, the key slot being adapted to receive a proper key inserted axially into an outer end of the lock plug and into a final operable position with an inner end of the key within the lock plug spaced axially from an inner end of the plug, an axially extending torque blade directly connected to the inner end of the lock plug through a limited lost motion drive permitting limited relative rotation between the plug and torque blade and rotative driving connection therebetween at ends of the limited lost motion drive; the improvements comprising: a barrier



positioned substantially totally in said lock plug having a substantially flat central portion extending radially across and axially blocking said key slot axially between said key inner end and said torque blade when said key is positioned in said final operable position in said plug key slot, said barrier having edge portions received in radial recesses of said lock plug opening radially into said key slot retaining said barrier at all times rotatable with said lock plug and against axial movement in either axial direction at all times spaced from and free of contact with said torque blade.

4,215,558

PROCESS OF MANUFACTURING A TAPER LEAF SPRING AND ITS DEVICE

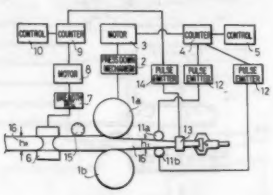
Heijiro Shiguma; Jun Takahashi; Yoshihiro Sakai, and Akira Ohno, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jan. 2, 1979, Ser. No. 95

Claims priority, application Japan, Dec. 30, 1977, 52/159784

Int. Cl.[2] B21B *37/00*

U.S. Cl. 72—9 **4 Claims**



1. A process of manufacturing a taper leaf spring from a material plate, the process using a pair of rolling rollers positioned downstream of a pair of edge rollers and comprising:

positioning a pair of plate thickness and length measuring rollers, and a pair of plate breadth measuring rollers downstream of the rolling rollers;

passing the material plate through the edge and rolling rollers;

measuring and transmitting, via pulse transmitters, signals representative of plate thickness and plate length of the material plate after rolling;

comparing transmitted signals with predetermined values to determine a first correction signal;

applying the first correction signal to means controlling spacing between the rolling rollers;

measuring and transmitting, via a pulse transmitter, a signal representative of plate breadth after rolling;

comparing the transmitted signal with a predetermined value to determine a second correction signal; and

applying the second correction signal to means controlling spacing between the edge rollers so that said edge and said rolling rollers, when adjusted, roll the material plate in a single pass.

4,215,559

CORRUGATION APPARATUS

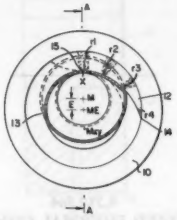
Hubert Kuypers, Bad Nenndorf, Fed. Rep. of Germany, assignor to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,516

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2804990

Int. Cl.³ B21D *15/06*

U.S. Cl. 72—77 **5 Claims**



1. In a corrugating ring of a corrugating apparatus for continuously corrugating a thin-walled metal tube to form annular corrugations in the outer and opposite interior surfaces of said thin-walled metal tube, said apparatus including a housing having a rotatably driven corrugating head supported coaxially with the metal tube to be corrugated, said corrugating ring freely rotatable eccentrically with respect to said metal tube, said corrugating ring including on its surface facing said metal tube a unitary helical corrugating rib, the improvement comprising:

said helical corrugating rib increasing in height from the beginning thereof to a point of increased height to increase corrugation depth, said increased height extending over at least 360°, said helical corrugating rib having a curved corrugating surface, the radius of curvature of the corrugating surface increasing from the beginning of the helical corrugating rib to the point of increased height of the helical corrugating rib whereby corrugation width is increased with corrugation depth.

4,215,560

PROCESS AND DEVICE FOR MANUFACTURING COMPOSITE SECTIONS AND SIMILAR PRODUCTS

Adolf Ames, Hilzingen, Fed. Rep. of Germany; Jean-Jacques Theler, Neunkirch, Switzerland, and Alfred Wagner, Steisslingen, Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

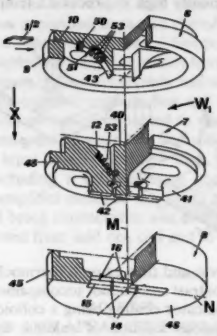
Continuation-in-part of Ser. No. 593,040, Jul. 3, 1975, Pat. No. 4,167,866. This application Mar. 19, 1979, Ser. No. 21,935

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1976, 2432541

Int. Cl.³ B21C *23/22, 25/06*

U.S. Cl. 72—258 **5 Claims**

1. In an extrusion device for manufacturing composite sections including at least a metal and two flat metal strips and comprising an entry plate, a mandrel plate and a die plate having a die opening defined therein with short and long axes, the improvement comprising: two substantially symmetrical feeding channels for feeding in said metal strips defined by at least some of said plates, said feeding channels extending through said mandrel plate and uniting unobstructedly thereby defining a passageway extending substantially parallel to said short axis at said die opening and opening into said die plate,



whereby said metal and said metal strips are separate in said entry plate and said mandrel plate and contact each other in said die opening, wherein there is provided at least one region of curvature in said feeding channels to promote low friction.

4,215,561

ADJUSTABLE END-OF-STROKE DEVICE FOR DIES FOR SHAPING THE WINDING HEADS OF ELECTRIC MOTOR STATORS

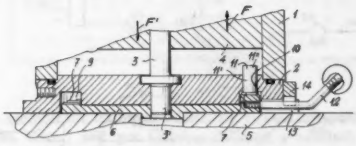
Franco DeCamilli, Varese, Italy, assignor to Sisme Societa Italiana Statori Motori Electric S.p.A., Italy

Filed Apr. 6, 1978, Ser. No. 894,155

Claims priority, application Italy, Apr. 18, 1977, 21130/77[U]

Int. Cl.² B21D *37/14*

U.S. Cl. 72—473 **1 Claim**



1. In a press means for shaping the winding heads of electric motor stator by means of movable shaping die units, an adjustable end-of-stroke device comprising a disc shaped cam rotatably mounted around an axis, an arcuate arrangement of steps on one of the faces of said cam, and abutment means cooperating with a selected one of the steps for stopping the movement of at least one of said movable die units, said abutment means being a pin slidably mounted in a guiding hole of a stationary cover for said cam.

4,215,562

METHOD FOR DETECTING SURFACE AND SUBSURFACE FLAWS IN ROLLED PRODUCTS

Evgeny F. Gavrilin, ulitsa shosse Metallurgov, 53a, kv. 217; Alexandr N. Belokur, ulitsa Degtyareva 40a, kv. 6; Artur L. Daiker, ulitsa, B. Khmelnitskogo, 27, kv. 11; Anatoly E. Konash, ulitsa Molodogvardeitsev, 46, kv. 10; Vladislav V. Basov, ulitsa Stalevarov, 27, kv. 11, and Nikolai F. Moskvin, ulitsa Peti Kalmykova, 16, kv. 32, all of Chelyabinsk, U.S.S.R.

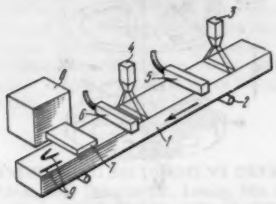
Filed Apr. 19, 1978, Ser. No. 898,424

Int. Cl.² G01N *25/72*

U.S. Cl. 73—15 FD **8 Claims**

1. A method for detecting surface and subsurface flaws in rolled products, comprising applying an indicator coating,

comprising a background component and a contrast component, onto the surface of a relatively cold rolled product, the contrast component being a heat-sensitive compound, and heating the rolled product with high-frequency currents to a temperature sufficiently high to produce a temperature gradi-



ent in defective areas and thus cause a thermochemical transformation of the contrast compound, accompanied by a change in its color, said indicator coating being a colloidal suspension comprising an aqueous solution of calcium hydroxide and soluble potato starch with the following ratio between the ingredients:

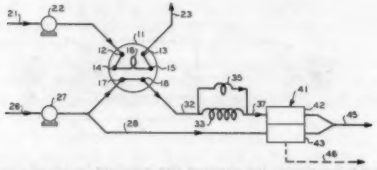
calcium hydroxide,	30 to 160 g/l
soluble potato starch,	5 to 20 g/l.

4,215,563

CHROMATOGRAPHIC ANALYSIS NORMALIZER

Edwin K. Clardy, and Buell O. Ayers, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 15, 1976, Ser. No. 705,486
Int. Cl.[2] G01N *31/08*
U.S. Cl. 73—23.1 **12 Claims**



1. A method for determining the proportionate amounts of chromatographically separable constituents within a material, said method comprising:

introducing a sample of said material into a carrier fluid in a chromatographic separation apparatus;

passing carrier fluid containing a first portion of said sample through a bypass conduit means to a sample detection means;

passing carrier fluid containing a second portion of said sample through a chromatographic separation column to said sample detection means; said bypass conduit means containing packing material capable of presenting a resistance to flow but incapable of seriously delaying any of the sample constituents, said bypass conduit means being of such length and of such restriction to flow that the flow rate of carrier fluid and sample fluid therethrough bears a predetermined relationship to the flow rate of carrier fluid and sample fluid through said chromatographic separation column and that said first portion of said sample passes through said sample detection means prior to arrival of any portion of said second portion of said sample at said sample detection means;

generating, in response to the output of said sample detection means, a first signal from which information can be obtained indicative of the total amount of sample material in said first portion of said sample;

generating, in response to the output of said sample detection means, at least one second signal, each said second signal being a signal from which information can be obtained indicative of the amount of a respective selected constituent or group of constituents separated from the remaining constituents of said second portion of said sample by said chromatographic separation column; and

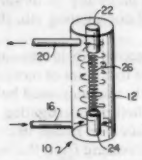
generating, in response to said first signal and each respective one of said at least one second signals, a corresponding number of third signals, each said third signal being associated with a respective one of said second signals and being a signal from which information can be obtained indicative of the relative amount of the respective said constituent or group of constituents represented by the respective second signal present within said sample of said material.

4,215,564

MINIATURIZED THERMAL CONDUCTIVITY DETECTOR

Alexander E. Lawson, Mendham, and Robert J. Mathieu, Mountain Lakes, both of N.J., assignors to Gow-Mac Instrument Co., Bound Brook, N.J.

Filed Feb. 6, 1979, Ser. No. 9,949
Int. Cl.[2] G01N *25/00*
U.S. Cl. 73—27 R **3 Claims**



1. A hot wire thermal conductivity detector cell having an internal free space volume per cavity of less than 50 microliters comprising a cylindrical cavity with

(a) a first tangential opening in the side wall of said cavity forming a gas entrance port, said first opening being adjacent one end of said cavity, and a second tangential opening in the side wall of said cavity forming a gas outlet port, said second opening being adjacent the other end of said cavity;

(b) a first pin extending axially from the end of said cavity adjacent the gas inlet port opening to a point beyond the gas inlet port opening, and a second pin extending axially from the other end of said cavity adjacent the gas outlet port opening to a point beyond the gas outlet port opening;

(c) a filament mounted axially of said cavity on and between said pins,

whereby the gas entering through the gas inlet port opening flows into a toroidal passage within said cavity and the gas leaving through the gas outlet port flows out from a toroidal passage within said cavity.

4,215,565

METHOD AND APPARATUS FOR TESTING A FLUID

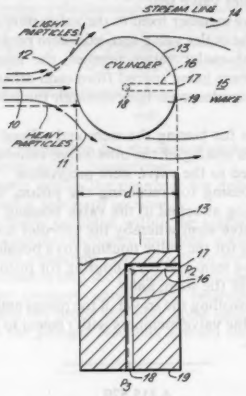
Klaus J. Zanker, Four Marks, England, assignor to Agar Instrumentation Inc., Houston, Tex.

Continuation-in-part of Ser. No. 829,997, Sep. 1, 1977, abandoned. This application Sep. 19, 1978, Ser. No. 943,899

Claims priority, application United Kingdom, Aug. 7, 1978, 32495/78

Int. Cl.³ G01F *1/68, 5/00*; G01N *1/14, 9/00*

U.S. Cl. 73—30 **24 Claims**



1. A method of testing a fluid comprising passing a main flow of a fluid through a conduit, inserting into said conduit a substantially cylindrical probe having an inlet opening which faces downstream of the conduit and which communicates with an outlet opening which is disposed in an end surface of the probe, the said end surface being disposed within and spaced from the wall of the conduit; the said main flow, in passing through the conduit, causing a sampling flow of the fluid to be drawn from the conduit, and to be passed through the probe from the inlet opening to the outlet opening, and so back to the conduit; and testing said sampling flow.

4,215,566

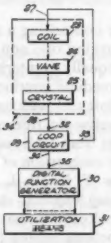
DENSITOMETER WITH VOLTAGE DRIVER

Iraj Ghahramani, Los Angeles, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,300

Int. Cl.³ G01N *9/34*

U.S. Cl. 73—32 A **5 Claims**



1. A vibration densitometer comprising: a probe including a vibratable vane, an electromagnetic drive coil energizable to vibrate said vane, and a piezoelectric crystal fixed relative to one portion of said vane to produce an output signal in phase with the vibration of said vane; a loop circuit connected from said crystal to said coil to impart vibration to said vane, said loop circuit including an amplifier circuit connected from said crystal, and a driver circuit connected from said amplifier circuit to said coil; a digital function generator connected from said loop circuit to produce an output directly proportional to the density of a fluid in which said vane is immersed; and utilization means connected from said digital function generator to utilize the output of said digital function generator, said driver circuit including amplifier means having inverting and noninverting inputs, means to maintain said noninverting input at a substantially constant voltage, first and second junctions, said amplifier circuit being connected to said first junction, a first resistor connected between said first and second junctions, said inverting input being connected from said second junction, means including a third junction connected from the output of said amplifier means to one end of said coil, the other end of said coil being connected to said first junction, a second resistor connected from said one coil end to said second junction.

4,215,567

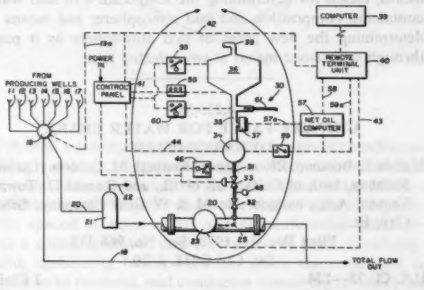
METHOD AND APPARATUS FOR TESTING A PRODUCTION STREAM

Richard J. Vicek, Englewood, Colo., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,512

Int. Cl.² G01N *1/10, 33/28*

U.S. Cl. 73—61.1 R **15 Claims**



10. A method for testing a production stream comprised of crude oil, water, and gas flowing through a conduit, said method comprising:

pumping a sample portion of said production stream from said conduit through a sample line and into a sample chamber;

allowing said sample portion to set in said sample chamber for a defined period of time;

pumping said sample portion from said sample chamber, through said sample line, and back into said conduit after said defined period of time has elapsed; and

measuring the water and the oil content of said sample portion as it is pumped from said sample chamber back into said conduit.

4,215,568

RAPID WATER ACTIVITY DETERMINING DEVICE AND METHOD

Esther B. Garber, Brookline, and Lloyd Cox, Natick, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

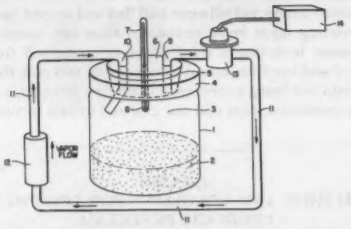
Filed May 31, 1979, Ser. No. 44,125

Int. Cl.³ G01N *25/56*

U.S. Cl. 73—73 **10 Claims**

1. Apparatus for rapidly determining water activity of water-containing compositions within approximately ten minutes comprising, a closed container for holding a sample of a water-

containing composition the water activity of which is to be determined; a closed conduit for conducting atmosphere from a first point in the interior of said closed container through a path exterior to said closed container and back into said closed container at a second point therein; a sensor means located in said closed conduit so that said atmosphere passes therethrough for sensing the condensation of moisture therein and the evaporation of moisture therefrom; an optically sensed, thermoelectrically cooled, condensation dew point hygrometer connected to said sensor means for detecting the dew point of said atmosphere; a substantially non-heat-generating pump means located in said closed conduit so that said atmosphere passes therethrough and is forced thereby to circulate through said closed container, said closed conduit, and said sensor means; means for determining the temperature of said water-containing composition and said atmosphere; and means for determining the dew point of said atmosphere as it passes through said sensor means at any selected time.

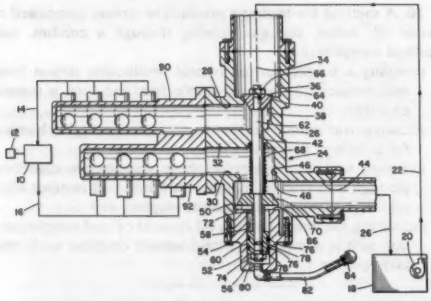


4,215,569

UNITARY VALVE FOR WATER BRAKE DYNAMOMETER

Melvin E. Bonomo, Bloomington; Kenneth M. Coldren; Loren L. Rathbun, both of Colfax, all of Ill., and Ronald D. Towner, Tucson, Ariz., assignors to M & W Gear Company, Gibson City, Ill.

Filed Dec. 11, 1978, Ser. No. 968,377
Int. Cl.[2] G01L 3/20
U.S. Cl. 73—134 **2 Claims**



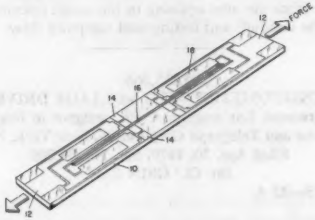
1. In a dynamometer of the type including:
a water brake;
means for supplying fluid to the brake;
means for receiving fluid from the brake;
means for sensing torque output from the brake;
the improvement comprising improved unitary adjustable valve means for simultaneously controlling fluid
input flow into the water brake and outlet flow from the water brake, said valve means including:
a valve housing, said housing having inlet and outlet channels defined by an inlet channel wall, an outlet channel wall, and an intermediate common wall separating the channels;
an inlet valve seat passage and seat in the inlet channel wall;
an outlet valve seat passage and seat in the outlet channel wall;
a valve stem passage in the common wall, said seats and passages being co-axial;
a valve stem in said valve stem passage extending axially through the valve seat passages and including a valve stem projection;
an inlet valve member fixed to the valve stem cooperative with the inlet valve seat;
an outlet valve member fixed to the valve stem and cooperative with the outlet valve seat, said stem projecting axially through the outlet valve member, the inlet and outlet valve members being spaced from each other on the stem to permit simultaneous flow through the inlet and outlet passages;
biasing means for biasing the stem and affixed valve members toward seating of the inlet valve member;
a piston affixed to the valve stem projection;
a cylinder housing for receiving the piston, said cylinder housing being attached to the valve housing in alignment with the valve stem whereby the cylinder housing serves as (a) a plug for the valve housing (b) a bushing and guide for the valve stem and (c) a housing for piston controlled movement of the stem; and
means for controlling the travel of the piston and thereby the position of the valve members with respect to the inlet and outlet seats.

4,215,570

MINIATURE QUARTZ RESONATOR FORCE TRANSDUCER

Errol P. Eer Nisse, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 20, 1979, Ser. No. 31,810
Int. Cl.[2] G01L 1/10
U.S. Cl. 73—141 R **4 Claims**



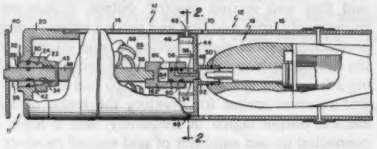
1. A force transducer comprising a thin, rectangular piezoelectric quartz crystal having two non-vibratory end portions for transmitting forces equally to intermediate interconnecting bar portions, two intermediate continuous vibratory bar portions intermediate and integral with said end portions spaced from each other by a narrow slot through said crystal with slot ends disposed equidistant from each end portion of said crystal and extending along the midportion of the crystal; said quartz crystal having thickness T, length L about 100T, width W about 10T, said slot having length L_s about 0.6L and width W_s no greater than T, said end portions having length L_e about 2W and each of said bar portions having length L_b about L_s and width W_b greater than 2.5T; means carried by each of said bar portions and extending therealong throughout the lengths of each of the bar portions for setting the bar portions into resonant vibrations at frequencies proportional to forces applied to said end portions; said end portions coupling together the vibrations of each bar portion to provide a mechanical Q about 100,000.

4,215,571

EXPENDABLE BATHYTHERMOGRAPH FOR USE UNDER ICE

Ralph P. Crist, Harrisburg, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1971, Ser. No. 105,879
Int. Cl.[3] G01W *1/00*
U.S. Cl. 73—170 A **4 Claims**



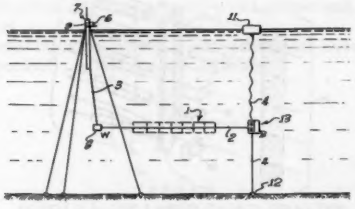
1. A release mechanism for the sensor probe of a cannister type bathythermograph, comprising:
- a wall member within the cannister for defining a forward section and a rearward section;
- a probe assembly mounted within the rearward section;
- a plunger assembly movably mounted within the forward section and extending externally from the cannister; and
- means interconnecting the plunger and probe assemblies for providing pressure equalization between the forward section and the probe assembly upon sufficient impacting to move the plunger assembly toward the rearward section.

4,215,572

APPARATUS AND METHOD FOR SUPPORTING OCEANOGRAPHIC EQUIPMENT AT SELECTED OCEAN DEPTHS

Fred N. Spiess, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 24, 1978, Ser. No. 936,450
Int. Cl.[2] G01W *1/00*; B63B *21/52*
U.S. Cl. 73—170 A **7 Claims**



3. Apparatus for supporting oceanographic equipment at selected ocean levels comprising:
- a floatable platform,
- an unanchored end-weighted line suspendably carried by said platform in a freely-suspended disposition,
- means carried by said platform for deploying said line,
- a guide line,
- flotation means for supporting the guide line at a surface location spaced from said platform,
- anchor means for holding the guide line in a vertical disposition spaced from said suspended weighted line,
- a positively buoyant line-crawling package mounted on the guide line, and including:
- driving means for moving said package along the guide line to a selected location, and
- means for gripping said guide line at said location for exerting the positive buoyant force of the package on it, and
- a tension line coupling said end-weighted line to said buoyant package for providing support for said oceanographic equipment,

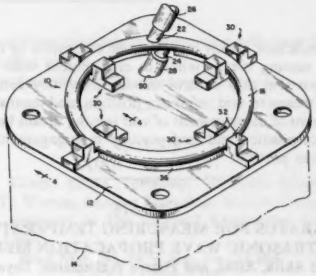
whereby said line-crawling package can be disposed at a selected ocean level and said weighted line deployed to cause said tension line to extend in a horizontal direction at said selected level, said end-weighted line having its in-water negative buoyancy matched to the positive buoyancy of said buoyant package for exerting opposite tension-producing forces on said tension line whereby said horizontal disposition is maintained and said oceanographic equipment is supported at said selected level.

4,215,573

FLUID METERING DEVICE

Wesley M. Tufts, 154 Holly La., Holliston, Mass. 01746

Filed Nov. 29, 1978, Ser. No. 964,713
Int. Cl.[3] G01F *3/08*
U.S. Cl. 73—255 **11 Claims**



1. A fluid metering device comprising an annular conductor defining a passage of predetermined uniform cross section, a rigid panel having a planar top surface, means on said surface for releasably attaching the conductor thereto comprising four blocks spaced at equal radial and circumferential distances about a common center, said blocks having pairs of radially-spaced, upstanding bosses between which the conductor is adapted to be received, said conductor containing an inlet port through which the fluid to be metered is supplied to the conductor and an outlet port through which the fluid to be metered is discharged, a ball situated in the passage which is free to move along the passage by the fluid pressure of the fluid delivered to the conductor, said ball being of a diameter corresponding to the inside diameter of the passage, sensing means mounted to the support adjacent the conductor for sensing the passage of the ball within the conductor, a fluid pump and means operably connecting the sensing means to the fluid pump to increase or decrease the supply of fluid to the conductor in inverse proportion to the travel of the ball along said passage.

4,215,574

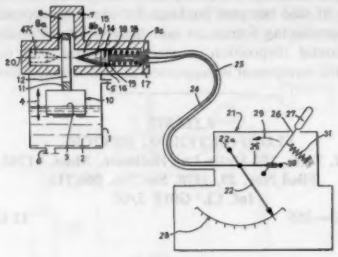
INDICATION OF THE MOMENTARY VALUE OF LIQUID LEVEL

Michel Godeux, Bougival, France, assignor to Claude A. Patalidis, Lathrup Village, Mich., a part interest

Filed Nov. 7, 1978, Ser. No. 958,404
Claims priority, application France, Nov. 8, 1977, 7733594
Int. Cl.[2] G01F *23/08*
U.S. Cl. 73—314 **16 Claims**

1. Apparatus for checking or measuring the momentary value of a variable physical magnitude comprising a movable transducer, means connecting said movable transducer to the physical magnitude to be checked or measured and displacing said transducer from a reference position as a function of any small variation of said magnitude, a portion of said transducer

having a cross-section progressively varying as a function of the displacement of said transducer, sensing means in registry with said transducer portion and normally in a reference position away from said transducer, control means displacing said sensing means in abutting engagement with said transducer portion for selectively checking displacement of said transducer, indicator means providing an indication of the position of said sensing means when in engagement with said transducer portion, said control means selectively returning said sensing means to said reference position, and means measuring the amount of displacement of said sensing means between said reference position and said position in engagement with said transducer portion.



4,215,575

APPARATUS FOR MEASURING TEMPERATURE OF ULTRASONIC WAVE PROPAGATION MEDIUM

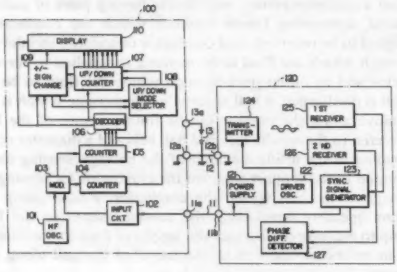
Sigeyuki Akita, Aichi, and Hisato Wakamatsu, Toyota, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 2, 1978, Ser. No. 957,194

Claims priority, application Japan, Jan. 27, 1978, 53-8643; Jan. 31, 1978, 53-9568

Int. Cl.[2] G01K *11/24*

U.S. Cl. 73—339 A **6 Claims**



1. An apparatus for measuring the temperature of an ultrasonic wave propagation medium comprising:

transmitter means for transmitting an ultrasonic wave into an ultrasonic wave propagation medium, said transmitter means including an oscillator for producing periodic pulses at a fixed frequency, and an ultrasonic transducer connected to said oscillator for transducing each of said periodic pulses into said ultrasonic wave;

first receiver means positioned along the sound propagation path in said propagation medium for receiving said ultrasonic wave transmitted from said transmitter means and synchronously producing a first electric output signal indicative of the received ultrasonic wave;

second receiver means positioned along said sound propagation path in said propagation medium and distanced from said first receiver means for receiving said ultrasonic wave transmitted from said transmitter means and synchronously producing a second electric output signal indicative of the received ultrasonic wave, each of said first and second receiver means including an ultrasonic transducer for transducing the received ultrasonic waves into corresponding electric signal trains, and an amplifier connected to the corresponding ultrasonic transducer for amplifying the corresponding electric signal trains to produce trains of said corresponding electric output signal;

detector means for detecting the phase difference between said first and second electric output signals produced respectively from said first and second receiver means and producing a pulse signal having a time interval equal to the detected phase difference, said detector means including a frequency divider connected to said amplifier of said first receiver means for dividing the trains of said first electric output signal in frequency, and a logic circuit connected to said amplifier of said second receiver means and said frequency divider for subjecting the trains of said second electric output signal and the trains of frequency divider output signal to a predetermined logic operation, whereby said pulse signal having the phase difference time interval is produced relative to a predetermined number of productions of said first electric output signal; and

measuring means for measuring said time interval of said pulse signal produced from said detector means and providing an output indicative of the temperature of said propagation medium.

4,215,576

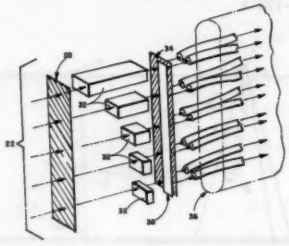
OPTICAL TEMPERATURE SENSOR UTILIZING BIREFRINGENT CRYSTALS

William H. Quick, La Habra Heights; Kenneth A. James, Corona del Mar, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 22, 1979, Ser. No. 5,618

Int. Cl.[2] G01K *11/14*

U.S. Cl. 73—356 **16 Claims**



1. An optical transducer for sensing temperature, said transducer comprising:

first polarizing means adapted to polarize incident light signals supplied thereto,

temperature sensitive crystal means adapted to rotate the resulting polarization vector produced by said first polarizing means through a particular angle, which angle is proportional to temperature,

said temperature sensitive crystal means comprising a plurality of birefringent crystals having various lengths, the respective lengths of said birefringent crystals determining the relative sensitivities thereof to temperature change, and

second polarizing means adapted to cause the intensity of the light signals transmitted through said temperature sensitive crystal means to vary with temperature, so that the optical characteristics of output light signals from said second polarizing means are indicative of a temperature to

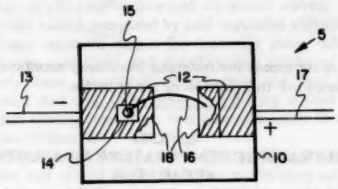
be sensed, said temperature sensitive crystal means positioned between said first and second polarizing means.

4,215,577

UTILIZATION OF DIODES AS WIDE RANGE RESPONSIVE THERMOMETERS

Bruce F. Griffing, Lafayette, and Srinivasarao A. Shivashankar, West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 28, 1978, Ser. No. 937,196
Int. Cl.³ G01K 7/18
U.S. Cl. 73—362 SC **1 Claim**



1. A temperature sensing diode comprised of:
an efficient heat conducting substrate with good electrical insulating capacity;
a metal cathode secured to said substrate, said metal being selected so that it does not develop differential stresses in an operative range between about 1.9° K to about 400° K;
a semi-conductor chip made of gallium arsenide phosphide having light emission characteristics of an electroluminescent diode suitable for use as a temperature sensor, said chip being secured to said metal cathode;
a metal anode secured to said substrate, said metal being selected so that it does not develop differential stresses in said operative range;
an electrical conductor connecting said cathode and anode; and
external input and output connector terminals located, respectively, on said cathode and anode.

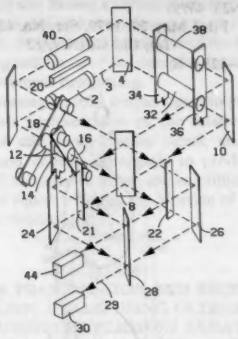
4,215,578

DIPOLE MASS LASER-BASED GRAVITY GRADIOMETER

Theodore V. Lautzenhiser, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 910,971, May 30, 1978, abandoned. This application May 15, 1979, Ser. No. 39,409
Int. Cl.² G01V 7/12
U.S. Cl. 73—382 G **15 Claims**

1. A gravity gradiometer comprising:
a laser for generating a laser beam having a plurality of circular polarization modes;
a modulator comprising a photoelastic element positioned in the path of the laser beam for differentially altering the characteristics of the polarization modes in response to the application of a stress, said modulator fixedly supported at its center relative to the path of the laser beam;
first and second mass dipoles bonded to first and second ends of the modulator, said dipoles positioned at substantially right angles to each other, whereby a gravity gradient in a plane perpendicular to the path of the laser beam produces torques in said mass dipoles which are coupled to



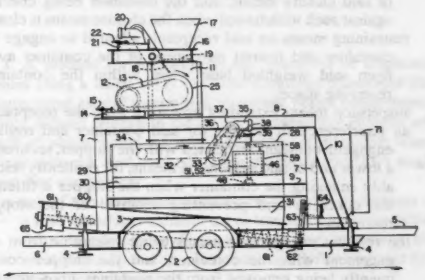
said modulator to produce a frequency difference between said modes; and
means for detecting said frequency difference.

4,215,579

COAL SAMPLING

David M. Hines, Crane Township, Wyondot County, and Charles D. Waring, Marion Township, Marion County, both of Ohio, assignors to The Fairfield Engineering Company, Marion, Ohio

Filed Mar. 20, 1979, Ser. No. 22,303
Int. Cl.² G01N 1/20
U.S. Cl. 73—424 **4 Claims**



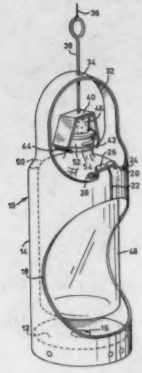
1. Sampling apparatus for coal and the like comprising a housing surrounding and enclosing a space, a primary sample crusher mounted adjacent the housing, a receiving hopper for coal and the like positioned to receive coal and the like outside the housing and to supply coal and the like to the primary crusher, a discharge from the primary crusher disposed to deliver crushed material within the housing, a conveyor belt within the housing, the conveyor being positioned below the primary crusher discharge to receive crushed material therefrom and to convey the crushed material to the end of the belt for free fall within the housing, a swingable arm located within the housing and positioned adjacent the end of the conveyor belt from which material is delivered, a sample container holder on the swingable arm, a sample container mounted in the holder, said arm and sample container being positioned for movement of the sample container across and through a stream of material falling from the end of the conveyor belt, drive means in driving relationship to both the conveyor belt and the swingable arm whereby the swingable arm is driven in fixed relation to the speed of the conveyor belt.

4,215,580

FLUID SAMPLING APPARATUS

Reginald G. Barsaloux, 93 Lynndale Rd., Simcoe, Ontario, Canada (N3Y 4W9)

Filed May 29, 1979, Ser. No. 43,590
Int. Cl.[2] G01N *1/12*
U.S. Cl. 73—425.4 R **10 Claims**



1. A receptacle for releasable reception therein of an interference fit stoppered type container,

said receptacle comprising:

a weighted base and side wall extending upwardly therefrom to define a container-receiving space, said side wall having a front opening therein and closure means, permitting withdrawal of a container from the container-receiving space forwardly through said front opening upon opening of said closure means, and the container being checked against such withdrawal when the closure means is closed;

restraining means on said receptacle adapted to engage the container and restrict movement of the container away from said weighted base when within the container-receiving space;

suspension means extending upwardly from the receptacle;

an interference fit stopper for said container and resilient engagement means associated with the stopper, secured to a lower end of said suspension means, for resiliently releasably engaging the container when the stopper is fitted to the container and preventing removal of the stopper therefrom;

the resilient engagement means being releasable from engagement with the container, and the stopper consequently being removed from the container, upon upward jerking force applied to the suspension means;

the receptacle being suspendable by said suspension means whether or not the resilient engagement means and the stopper are in engagement with the container.

4,215,581

PRESSURE REGULATOR ASSEMBLY GUARD

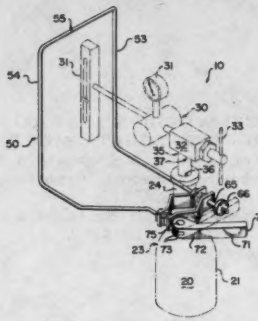
Stephen M. Bolick, 2417 Windbreak Dr., Alexandria, Va. 22306, and John O. Vought, 9256 Sprucewood Rd., Burke, Va. 22015

Filed Sep. 13, 1979, Ser. No. 74,853
Int. Cl.[3] G01D *11/24*
U.S. Cl. 73—431 **9 Claims**

1. A gauge guard for use with a pressure regulating assembly, including pressure regulating valves, regulator gauges and a plurality of fluid couplings operatively connecting the regulator assembly to a source of pressurized gas; where the source of pressurized gas is an elongated cylinder, having a cylindrical throat member into which one of the plurality of fluid couplings is inserted, the gauge guard comprising;

a pair of clamp members engaging a portion of the cylinder,

a rigid framework, extending through the clamp members which is spaced from, and projects below, beyond and above the regulator assembly, and



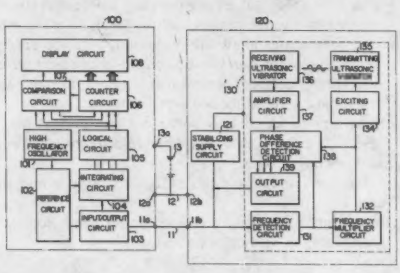
a securing means for fastening the clamp members and the framework to a portion of the cylinder.

4,215,582

ULTRASONIC TEMPERATURE MEASURING APPARATUS

Sigeyuki Akita, Aichi, Japan, assignor to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 14, 1979, Ser. No. 12,134
Claims priority, application Japan, Apr. 26, 1978, 53-50371
Int. Cl.[2] G01N *29/00*; G01K *11/24*
U.S. Cl. 73—579 **1 Claim**



1. An apparatus for measuring a temperature of an ultrasonic wave propagation medium comprising:

an electric power source for supplying a direct current voltage having a first amplitude;

first pulse means energized by said direct current voltage of said electric power source for producing a train of first pulses at a first fixed frequency;

first amplitude modulation means for modulating said direct current voltage of said electric power source from said first magnitude to a second magnitude in response to said first pulses of said first pulse means, said first amplitude modulation means producing a modulated voltage the amplitude of which changes between said first and second amplitudes at said first fixed frequency;

an electric wire one end of which is connected to said first amplitude modulation means;

voltage regulator means connected to the other end of said electric wire for regulating said modulated voltage supplied from said first amplitude modulation means through said electric wire, said voltage regulator means supplying a regulated voltage;

second pulse means connected to said the other end of said electric wire and energized by said regulated voltage of

said voltage regulator means for detecting amplitude changes between said first and second amplitudes of said modulated voltage supplied from said amplitude modulation means through said electric wire, said second pulse means producing a train of second pulses at a frequency equal to said first fixed frequency of said first pulses;

third pulse means energized by said regulated voltage of said voltage regulator means for subjecting said second pulses of said second pulse means to a frequency multiplication, said third pulse means producing a train of third pulses at a third fixed frequency higher than said frequency of said second pulses;

transmitter means for transmitting ultrasonic waves into an ultrasonic wave propagation medium in response to said third pulses of said third pulse means;

receiver means for receiving said ultrasonic waves transmitted from said transmitter means through said porpagation medium, said receiver means producing a train of fourth pulses in response to received ultrasonic waves;

fifth pulse means energized by said regulated voltage of said voltage regulator means for detecting phase differences between said third and fourth pulses produced respectively from said third pulse means and said receiver means, said fifth pulse means producing a train of fifth pulses having respective time intervals equal to detected phase differences;

second amplitude modulation means connected to said the other end of said electric wire for modulating said modulated voltage of said first modulation means from said second amplitude to a third amplitude in response to said fifth pulses;

sixth pulse means connected to said one end of said electric wire for detecting amplitude changes between said second and third amplitudes of said modulated voltage modulated by said second amplitude modulation means, said sixth pulse means producing a train of sixth pulses having time intervals equal to said time intervals of said fifth pulses of said fifth pulse means; and

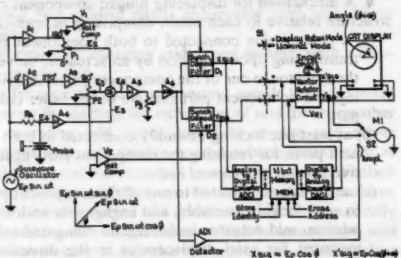
measuring means energized by said direct current voltage of said electric power source for measuring said time intervals of said sixth pulses of said sixth pulse means, said measuring means producing outputs indicative of a measured time interval.

4,215,583

APPARATUS AND METHOD FOR BONDTESTING BY ULTRASONIC COMPLEX IMPEDANCE PLANE ANALYSIS

Ronald J. Botsco, Huntington Beach; John E. Todd, Long Beach, and Robert L. Jones, La Habra, all of Calif., assignors to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Nov. 14, 1978, Ser. No. 960,704
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—582 **32 Claims**



1. An improved apparatus for non-destructively detecting and diagnosing flaws and other bondline conditions between the bonded layers of multilayered bonded structures, the apparatus having a sonic energy transceiver probe for physical contact with a surface of the structure, the complex impedance of the probe being indicative of the location of a detected bond flaw, the apparatus also having a source for generating a steady state sonic energy signal of known frequency, the signal being input to the probe, the phase and amplitude of the output signal of the probe being indicative of the complex impedance of the probe; the improvement comprising:

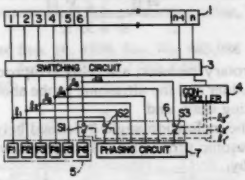
means for processing a probe output signal to produce component signals representative of the relative phase and amplitude of said probe output signal, and means for displaying said component signals to produce a visual indication of the relative phase and amplitude of the said probe output signal whereby the location of the detected bond flaw is determined.

4,215,584

METHOD FOR TRANSMISSION AND RECEPTION OF ULTRASONIC BEAMS USING ULTRASONIC TRANSDUCER ELEMENT ARRAY

Masao Kuroda, Nishioizumimachi, and Hiroshi Kanda, Hachioji, both of Japan, assignors to Hitachi Medical Corporation, Japan

Filed Sep. 7, 1977, Ser. No. 831,137
Claims priority, application Japan, Sep. 8, 1976, 51/106650
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—626 **11 Claims**



1. A method for transmission and reception of ultrasonic beams using a linear array of plural ultrasonic transducer elements, focal axes of transmitted ultrasonic beams being respectively defined relative to the planes of transducer element sets each of which includes a selected number of ultrasonic transducer elements, said method during the production of a single scan line comprising:

a step of simultaneously exciting the transducer elements of a first transducer element set to transmit ultrasonic beams from the transducer elements of said first transducer element set to a point on a first focal axis defined by said first transducer element set; and

a step of receiving said ultrasonic beams transmitted from said first transducer element set and reflected from an object by the transducer elements of a second transducer element set which defines a second focal axis different in position relative to the plane of the array than said first focal axis.

4,215,585

ULTRASONIC SCANNER

Yutaka Kunii; Toshikuni Shimoji, and Masaharu Jingu, all of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 21, 1977, Ser. No. 789,742
Claims priority, application Japan, Apr. 23, 1976, 51/46153
Int. Cl.[2] A61B *5/00*
U.S. Cl. 73—633 **8 Claims**

1. An ultrasonic scanner for rotatably reciprocating an ultrasonic probe to sector scan a subject to be examined comprising:

a pivotable holder for supporting the ultrasonic probe;

a pivoting shaft pivotably mounted on said holder for per-

mitting the holder to be reciprocated rotatably about the pivoting shaft;

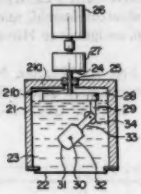
a rotatable drive shaft having an axis perpendicular to the axis of the pivoting shaft; and

transmission means for transforming the rotary motion of the drive shaft to a rotatably reciprocating motion of the ultrasonic probe, said means including:

(i) a guide member provided at one end of the holder and having a longitudinal slide means which remains parallel to the axis of the pivoting shaft throughout the rotatable reciprocation of the holder about the pivoting shaft;

(ii) a rotary member fixedly coupled to the drive shaft; and

(iii) a transmission rod parallel to said drive shaft, said transmission rod having one end connected to the rotary member at a predetermined distance from the axis of the drive shaft and the other end slideably engaged with said longitudinal slide means to impart through said guide member, upon the rotation of the drive shaft



and rotary member, a rotably reciprocating motion to the holder and the ultrasonic probe about the axis of the pivoting shaft, and

wherein the inclination angle θ defined between the axis of the ultrasonic probe and that of the drive shaft is represented by:

$$\theta = \sin^{-1}(r/R \sin wt)$$

where

r: radial distance of the axis of the transmission rod from the axis of the drive shaft,

R: radial distance between the intersection of the axis of the drive shaft with the axis of the pivoting shaft and the intersection of the axis of the transmission rod with the longitudinal slide means of the guide member,

w: angular speed of the transmission rod about the axis of the drive shaft, and

t: rotating time of the rotary member from a resting position at which t=0 and said inclination angle (θ)=0.

4,215,586

TRUCK TRANSMISSION WITH POWER TAKE-OFF

Charles M. Morris, Sr., Box 605, View, Tex. 79564

Filed Feb. 1, 1979, Ser. No. 8,283

Int. Cl.[2] F16H *37/00, 3/08*

U.S. Cl. 74—15.2 **6 Claims**

1. In a truck auxiliary transmission having

a. a main input shaft,

b. a main output shaft coaxial with the main input shaft,

c. a front gear affixed to the main input shaft,

d. a rear gear journalled to the main output shaft,

e. a slide means on the output shaft for locking the main output shaft to either the front gear or the rear gear or neutral,

f. two counter shafts, each counter shaft having

(i) a front counter shaft gear meshed with said front main gear, and

(ii) a rear counter shaft gear meshed with the rear main gear,

the improved structure comprising:

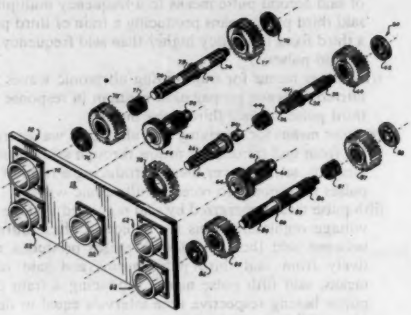
g. a pto shaft,

h. a front pto gear meshed with one of the front counter shaft gear and clearing the front main gear, and

j. a rear pto gear both meshed with the rear main gear and clearing both the rear counter shaft gears,

k. both the pto gears journalled to the pto shaft,

m. a pto slide mounted upon a spline upon the pto shaft,



n. said slide being adapted to be moved to a forward position to lock the front pto gear to the pto shaft,

o. said slide also adapted to be moved to a rear position to lock the rear pto gear to the pto shaft,

p. said slide further adapted to be in a neutral position

q. so that the pto shaft may be rotated forward, reverse or neutral with the main output shaft in either direct drive, underdrive or neutral.

4,215,587

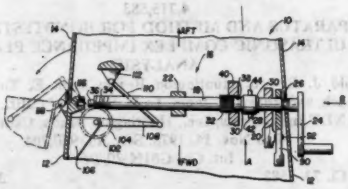
FOLDING MECHANISM

Adrian V. Kisovec, Wallingford, Pa., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 2, 1977, Ser. No. 821,069

Int. Cl.[2] F16H *25/08*

U.S. Cl. 74—22 R **12 Claims**



4. A mechanism for displacing hinged component parts of a structure relative to each other, comprising in combination:

(a) a transmission connected to both component parts, for transmitting upon actuation by an actuator, movement of the actuator to one of the component parts, thereby pivoting said component part relative to the other component part;

(b) at least one locking assembly connected to both component parts, for retaining the component parts against relative pivotal movement; and

(c) an actuator connected to one of the component parts and to each locking assembly, and engageable with the transmission, said actuator including: an elongated axle being mounted for axial displacement in the direction of its longitudinal axis and rotation about its longitudinal axis; means mounted partly on said axle for effecting said axial displacement, during rotation, and as a result thereof, locking and unlocking of the locking assemblies; and drive means for engagement with the transmission, for effecting

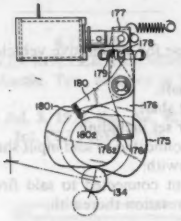
actuation of the transmission and pivoting of said component part relative to the other component part, said locking, unlocking and actuation being effected in a continuous operation.

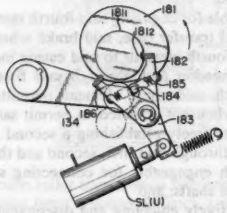
4,215,588

CONTROL DEVICE FOR AN INTERMITTENTLY MOVABLE DRIVER MEMBER

Shigehiro Komori, Yokohama; Hiroyuki Hattori, Tokyo; Tsuneki Inuzuka, Machida, and Koichi Miyamoto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 697,129, Jun. 17, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,388
Claims priority, application Japan, Jun. 26, 1975, 50/79890
Int. Cl.³ F16H *27/02*
U.S. Cl. 74—113 **1 Claim**





1. A control device for an intermittently movable driver member, wherein a follower member is disposed adjacent the driver member and is adapted to follow a driving surface of said driver member for displacement, retention and return displacement, said control device comprising:

a control member for controlling the starting and stopping of movement of said driver member, said control member having two control pawls engageable with said driver member;

clutch means for engaging said driver member with a driving source; and

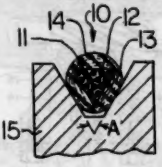
means for supplying first and second signals to said control member for starting the movement of said driver member by operating said clutch means to engage said driver member with said driving source, wherein movement of said driver member is started by said first signal to displace said follower member to its said retaining position, whereas movement of said driver member is automatically stopped by said clutch means which is actuated by said control member, and wherein movement of said driver member is restarted by said second signal to provide said return displacement of said follower member, at the completion of which said driver member is automatically stopped by said clutch means which is operated by said control member.

4,215,589

SELF ORIENTING POWER TRANSMISSION BELT

Anderson W. Howerton, Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Jul. 31, 1978, Ser. No. 929,608
Int. Cl.² G01F *1/06*
U.S. Cl. 474—62 **14 Claims**



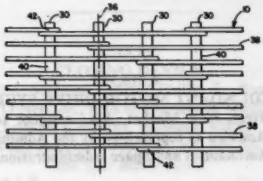
1. An endless power transmission belt having a round cross-section and a triangular core, said core comprising a plurality of longitudinally extending load-carrying cords embedded in a rubber compound.

4,215,590

BELT FOR TRANSMITTING POWER FROM A COGGED DRIVING MEMBER TO A COGGED DRIVEN MEMBER

Hossein Bahiman, Landover Hills, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 18, 1978, Ser. No. 943,086
Int. Cl.² F16G *1/12, 5/10*
U.S. Cl. 474—205 **11 Claims**



1. A belt for transmitting power from a cogged driving member to a cogged driven member, comprising;

a plurality of inflexible teeth means spaced along the direction of travel of said belt, said teeth means having a longitudinal axis transverse to said direction of belt travel; and

a plurality of substantially inextensible fast means spaced transversely to said direction of belt travel and extending in said direction of belt travel adjacent to said teeth means, each of said fast means being looped around selective teeth means, at least one unlooped teeth means being interposed between adjacent looped teeth means, and each fast means being looped around teeth means different from adjacent fast means, whereby said belt is substantially immune from longitudinal stretching, tooth slippage, fatigue, cracking, and premature failure.

4,215,591

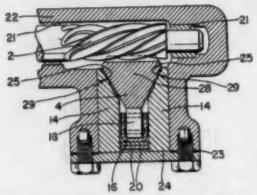
LOW FRICTION RACK AND PINION STEERING GEAR

Arthur E. Bishop, 17 Burton St., Mosman, N.S.W. 2088, Australia

Filed Feb. 8, 1978, Ser. No. 876,166
Claims priority, application Australia, Feb. 9, 1977, PC9004
Int. Cl.² F16H *1/18*
U.S. Cl. 74—422 **6 Claims**

1. In a rack and opinion gear comprising a rack having teeth on one face thereof for cooperation with a pinion, a two-phase rack support system including first and second supports, said

first support comprising at least one rolling element bearing on at least one face of the rack substantially opposite the toothed face of the rack, said first support being spring loaded to urge the rack into slack-free engagement with the pinion in a first or normal mode of operation of the steering gear associated with low-order steering forces, and a second support comprising a



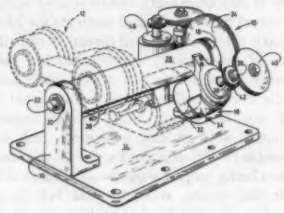
plain bearing face arranged to bear on at least one face of the rack opposite the toothed face of the rack, but normally out of contact with the rack by a small and predetermined clearance, whereby the rack moves away from the pinion under higher steering forces so that the rack then bears on the second support.

4,215,592

REDUNDANT MOTOR DRIVE SYSTEM

John A. Calvert, New Market, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 4, 1978, Ser. No. 931,217
Int. Cl.[2] F16H *37/06, 1/16*
U.S. Cl. 74—661 **5 Claims**



1. In a redundant motor drive system the improvement comprising:

A. a base;

B. a shaft mounted on said base and supported for rotation about the longitudinal axis thereof;

C. a worm gear coaxially aligned with said shaft; and

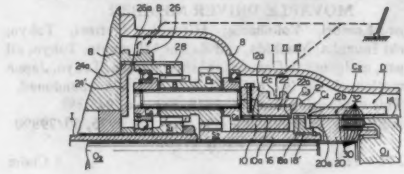
D. a pair of gear trains, each terminating in a gear worm meshed with said worm gear and characterized by a motor connected in driving relation with said worm, the motor for one gear train being mounted on said shaft and the motor for the other gear train being mounted on said base.

4,215,593

TRANSFER CASE FOR AUTOMOTIVE VEHICLES

Kinji Shono, Chofu, and Kunihiko Suzuki, Fujisawa, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 18, 1977, Ser. No. 843,437
Claims priority, application Japan, Oct. 25, 1976, 51-127382
Int. Cl.[2] F16H *37/06*
U.S. Cl. 74—665 D **25 Claims**



1. A transfer case for automotive vehicles comprising:

an input shaft;

a first output shaft;

a second output shaft;

a planetary gear set including

a first element connected to said input shaft for synchronous rotation therewith;

a second element connected to said first output shaft for synchronous rotation therewith;

a third element;

a first clutch engageable for interconnecting said third element with said second output shaft;

a fourth element:

a brake actuatable for engaging said fourth element with the casing of said transfer case, said brake when actuated to engage said fourth element to said casing inducing a first power transmission path through said first and second elements with said third element permitted to rotate freely, and when not actuated to permit said fourth element to rotate freely establishing a second power transmission path through said first, second and third elements;

a second clutch engageable for connecting said first and second output shafts; and

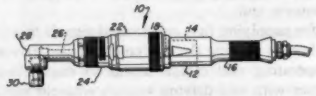
means for selectively engaging and disengaging said brake and said first and second clutches.

4,215,594

TORQUE RESPONSIVE SPEED SHIFT MECHANISM FOR POWER TOOL

William Workman, Jr., Spring Lake, and John R. Bos, Grand Haven, both of Mich., assignors to Cooper Industries, Inc., Houston, Tex.

Filed Jul. 14, 1978, Ser. No. 924,525
Int. Cl.[2] F16H *3/74*
U.S. Cl. 74—751 **10 Claims**



1. In a power tool for tightening threaded fasteners and the like:

a housing;

a drive motor disposed in said housing;

a driving spindle drivably connected to said motor;

a driven spindle;

a speed shift mechanism disposed in said housing interconnecting said driving and driven spindles and operable to reduce the rotational speed of said driven spindle with

respect to said driving spindle, said mechanism including a planetary gear set comprising a sun gear drivably connected to said driving spindle, and meshed with one or more planet gears, a carrier for said planet gears drivably connected to said driven spindle, and a ring gear meshed with said planet gears and disposed for rotation in at least one direction in said housing;

a torque responsive disengaging clutch including driving and driven clutch members interconnecting said planetary gear set and said driving spindle in such a way that said driven spindle is rotated at the speed of said driving spindle when said clutch members are engaged, and in response to a predetermined torque said driving and driven clutch member become disengaged to effect a reduced speed of said driven spindle with respect to said driving spindle; and,

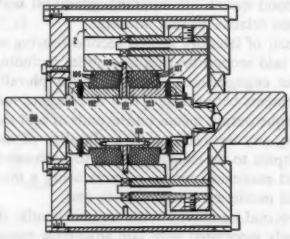
a torque responsive coupling operable in response to the disengagement of said clutch to hold said clutch disengaged as long as a predetermined torque is being transmitted to said driven spindle by said planetary gear set.

4,215,595

TRACTION ROLLER TRANSMISSION

Charles E. Kraus, Austin, Tex., assignor to Excelermatic, Inc., Austin, Tex.

Filed Jul. 3, 1978, Ser. No. 921,163
Int. Cl.[2] F16H *13/06*
U.S. Cl. 74—798 **5 Claims**



1. In a traction roller transmission comprising a traction ring structure having inner traction surfaces, a sun roller centrally disposed within the traction ring structure and having a circumferential traction surface spaced from the traction surface of said traction ring structure, planetary traction rollers supported in the space between the sun roller and the traction ring structure, and engagement means for forcing said traction rollers into frictional engagement with said traction ring structure and said sun roller; the improvement wherein at least one of said traction surfaces is formed by a stack of belleville type spring rings, and means are provided for axially compressing said belleville type spring rings when a torque is transmitted through said transmission so as to cause radial expansion of the spring rings for firm frictional engagement with the adjacent traction rollers.

4,215,596

GEAR SHIFT LEVER ASSEMBLY HAVING IGNITION SYSTEM DEENERGIZING MEANS

Leonard C. Long, R.D. No. 2, Annville, Pa. 17003

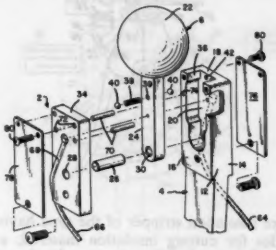
Filed Dec. 18, 1978, Ser. No. 970,670
Int. Cl.[3] B60K *41/08*
U.S. Cl. 74—851 **14 Claims**

1. A vehicle gear shifting lever assembly having signal generating means therein for generating a signal when said lever assembly is moved in to and fro directions during gear changing, said signal being usable to deenergize the ignition system of a vehicle during gear changing, said shifting lever assembly comprising:

a shifting lever part and a knob part, mounting means serving to mount said knob on one end of said lever, said mounting means permitting limited movement of said knob relative to said lever in the to and fro directions of movement of said lever

signal generating means in said lever and in said knob, said signal generating means being effective to produce a signal when said knob is moved relative to said lever, and

overload release coupling means serving releasably to couple said knob to said lever, said coupling means being



releasable upon application of a predetermined force to said knob which is less than the force required to move said lever in said to and fro directions whereby,

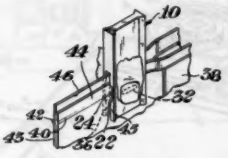
upon application of a force in excess of said predetermined force to said knob, said knob is moved relative to said lever thereby to produce a signal prior to movement of said lever, said signal being usable to deenergize the ignition system of the vehicle during movement of said lever with accompanying gear changing.

4,215,597

CLOSING DEVICE

John A. Miller, Midland, Mich.; Phillip L. Brookshire, and William J. O'Neil, Jr., both of Cincinnati, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1978, Ser. No. 942,101
Int. Cl.[2] B25B *27/02*
U.S. Cl. 81—9.1 R **9 Claims**



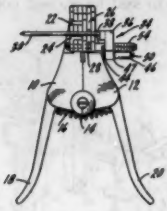
1. A closing device usable repeatedly for closing one or more containers having interlocking fastening elements, said device comprising a generally inverted U-shaped element having opposed legs extending from a bite portion, said legs having inside surfaces facing one another, said legs having a first means on their inside surfaces for guidingly engaging and aligning the fastening elements directly opposed to one another, a second means on the outside of said legs located directly opposite said first means, said second means being sensitive to finger touch, a third means on the outside of said legs for guiding the finger into a proper position over said second means, said second and third means permitting ready locating of said first means from the outside of the closing device, said closing device being comprised of semi-rigid material having sufficient flexure to permit said legs to come together to force the fastening elements to engage together.

4,215,598

WIRE INSULATION STRIP LENGTH GAUGE

Royzell F. Wells, Littleton, Colo., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Oct. 5, 1978, Ser. No. 948,955
Int. Cl.[2] H02G *1/12*; B26B *17/00*
U.S. Cl. 81—9.5 A **7 Claims**



1. In a wire insulation stripper of the type having a pair of stripper blades for cutting insulation material, a gauge for setting insulation strip lengths comprising:

a threaded stock attached to the stripper perpendicular to the plane of the stripper blades;

a wire stop having an abutment face located where it limits the distance the end of a wire can extend beyond the stripper blades; and

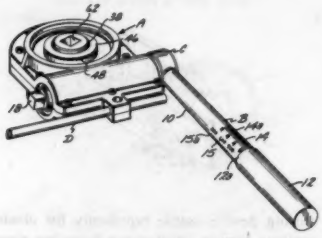
a rotatable transporter engaging the wire stop and having threads which engage those of the stock such that upon rotation the transporter is movable along the stock to vary the separation between the wire stop's abutment face and the stripper blades so that the insulation strip length is continuously adjustable.

4,215,599

TORQUE MULTIPLIER ASSEMBLY

Clarence F. Batchelder, El Cajon, and Kent B. Casady, San Diego, both of Calif., assignors to Khartli, Inc., San Diego, Calif.

Filed Aug. 28, 1978, Ser. No. 937,332
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—52.4 R **4 Claims**



1. In combination with an elongate torque wrench of the type that has a head, an elongate handle extending from said head, engageable torque input means on said head, manually adjustable means on said handle that limit the maximum torque said torque input means are concurrently rotated, a first numbered scale on said handle that is so operatively associated with said adjustable means as to visually indicate the particular maximum torque input for which said torque wrench is set, a torque multiplier assembly capable of exerting a predetermined maximum torque on a rotatable element, said torque multiplier including:

a. a shaft of substantial diameter and strength that is capable of withstanding the greatest of said maximum torques;

b. a worm gear that includes a cylindrical hub of less length than said shaft, said hub having said shaft extending therethrough, said worm gear centered on said shaft and said worm gear having first teeth on the periphery thereof;

c. first means for connecting said worm gear to said shaft to cause said worm gear and shaft to rotate as an integral unit;

d. a worm tangentially disposed to said worm gear, said worm including second teeth of spiral configuration that mesh with said first teeth, said worm gear having oppositely disposed cylindrical end portions;

e. torque receiving means on said end portions that removably engage said torque input means;

f. a substantially square housing having a depth substantially less than the length thereof, said housing having an opening therein which said worm gear is disposed and a second elongate opening tangential to said first opening in communication with the latter, said second opening having said worm therein, said housing having a generally flat side surface that may be disposed adjacent the element that is to be rotated;

g. a pair of laterally spaced first bearing assemblies, each of said first bearing assemblies including a first ring-shaped member that engages an exterior end portion of said hub, a second ring-shaped member that engages said housing, and a plurality of rotatable elements disposed between said first and second ring-shaped members;

h. a pair of laterally spaced oil seals mounted on said shaft adjacent said hub for maintaining lubricant within said housing;

i. second means for maintaining said oil seals in fixed positions relative to said housing;

j. a pair of laterally spaced second bearing assemblies, each of said second bearing assemblies including an inner race that engages said housing, and a plurality of rotatable elements between said first and second races;

k. torque output means on the ends of said shaft for transferring any desired one of a plurality of maximum torque outputs to an element that is to be rotated, with each of said maximum torque outputs being a multiple of one of said maximum torque inputs; and

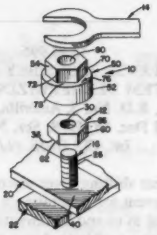
l. a second numbered scale on said handle that is so operatively associated with said adjustable means as to visually indicate the maximum torque that will be provided by said torque output means when said torque input means is in engagement with said torque receiving means and said torque wrench is actuated to rotate said torque input means.

4,215,600

TORQUE LIMITER FOR USE WITH OFF-THE-SHELF FASTENING ELEMENTS

David A. Kesselman, P.O. Box 299, Sonoma, Calif. 95476

Filed Oct. 12, 1978, Ser. No. 950,687
Int. Cl.[2] B25D *23/142*
U.S. Cl. 81—52.4 R **2 Claims**



1. A torque limiter for limiting the amount of torque applicable to an off-the-shelf fastener comprising:

a frangible unitary body having an upper section and a lower section, said lower section having a longitudinal bore defined therein and having a constant wall thickness at any perimetric location thereon;

torquing element contacting means on said upper section for contacting a torquing member to transfer torque from such torquing member to said unitary body;

fastener gripping means on said lower section for gripping an off-the-shelf fastener which is distinct from the torque limiter and transferring torque from a torquing member to such fastener, the torquing force being resisted by a fastener resistance to turning so that a tension inducing force arises in said lower section, said fastener gripping means being longitudinally spaced from said torque element contacting means;

said lower section including a portion which breaks along a line directed generally longitudinally of said body lower section under said tension induced forces when such tension induced forces reach a predetermined and precisely controlled level to release said fastener gripping means from gripping engagement with a fastener when a precisely predetermined amount of torque is applied to an off-the-shelf fastener thereby limiting and defining the amount of torque applicable to an off-the-shelf fastener.

4,215,601

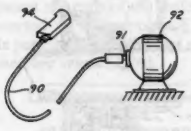
FLEXIBLE SHAFT TOOL HEAD

Steven R. Mann, P.O. Box 477, Eagle, Colo. 81631

Filed Mar. 16, 1979, Ser. No. 21,096

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.13 **5 Claims**



1. The combination of a tool head and a flexible drive shaft, comprising:

(a) a said tool head including a housing with a journalled shaft having one end connected to the flexible drive shaft and the other end having a gear secured to a rotary tool connector,

(b) said tool head having at least one electric switch including a trigger switch operating a remote electric motor and an electric connection receptacle connected therewith,

(c) a ratchet pawl mounted in said housing for ratcheting said gear for rotating the rotary connector for manual operation of said tool head, and

(d) said flexible drive shaft including a housing for the flexible drive shaft and a housing attached electric conduit providing remote control of said motor to which said tool head and said flexible drive are attached.

4,215,602

POWER TONGS

Kenneth J. Carstensen, and John J. Staudt, III, both of Odessa, Tex., assignors to Bob's Casing Crews, Odessa, Tex.

Filed Jun. 26, 1978, Ser. No. 919,365

Int. Cl.² B25B *17/00*

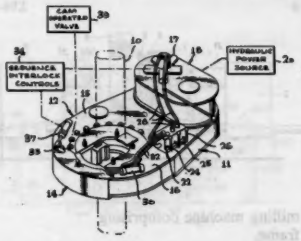
U.S. Cl. 81—57.18 **46 Claims**

1. A power tong for rotating cylindrical elements comprising:

upper and lower head plates having aligned side openings for receiving a cylindrical element to be rotated;

a rotary member disposed between the head plates and movable relative thereto about a central axis, and having an inner periphery defining a cam surface, a toothed outer periphery and a hinged section for opening to receive a cylindrical element to be rotated, the rotary member forming a complete loop when the hinged section is closed;

means including cover means coupled to the hinged section of said rotary member for controlling the hinge position thereof;



at least a pair of symmetrically disposed head means disposed between said head plates and radially movable therebetween in response to the position of the cam surface of said rotary member; and

chain drive means engaging the toothed periphery of said rotary member for providing rotary motion thereof relative to the central axis.

4,215,603

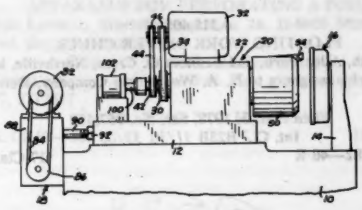
BRAKE DRUM TURNING MACHINE

Robert P. Jones, Warren, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

Filed Jul. 17, 1978, Ser. No. 925,448

Int. Cl.² B23B *5/02, 5/24, 5/44*

U.S. Cl. 82—1.3 **19 Claims**



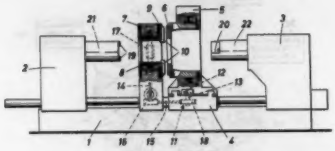
1. A machine for machining an axially extending surface of revolution on a workpiece so that the machining marks will be essentially circular rather than helical comprising, a support, a rotatable spindle movable axially on said support, means for rotating said spindle, means for supporting a workpiece so that the surface to be machined is coaxial with the spindle, a cutting tool mounted to rotate with said spindle and shiftable axially on the spindle, means for advancing said spindle axially in the feed direction at a predetermined rate during each machining cycle of the machine, means operative during said machining cycle for cyclically retracting the tool axially on the spindle in the opposite direction and at substantially the same rate as the spindle feed during a time period corresponding to at least one revolution of the spindle; and means operative following each cycle of operation of said cyclically operative means for shifting the tool on the spindle in the feed direction to the same extent during a time period corresponding to substantially less than one revolution of the spindle.

4,215,604

MILLING MACHINE

Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft, Steyr, Austria

Filed Nov. 8, 1978, Ser. No. 959,051
Claims priority, application Austria, Nov. 22, 1977, 8329/77
Int. Cl.[2] B23B 5/00, 5/18, 3/28
U.S. Cl. 82—20 6 Claims



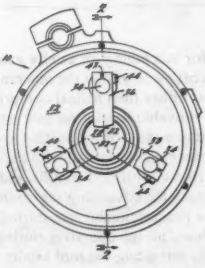
1. A milling machine comprising
(a) a frame,
(b) workpiece carriers mounted on the frame and spaced apart in a first direction,
(c) non-driven workpiece supports on the workpiece carriers and adapted to support a rotatable workpiece,
(d) a longitudinal slide mounted on the frame for movement in the first direction,
(e) a tool slide carried by the longitudinal slide for movement in a second direction transverse to the first direction,
(f) an internally cutting, annular milling cutter mounted on the tool slide and adapted to surround a respective one of the workpieces supported by the workpiece supports,
(g) a steady coupled to the longitudinal slide for movement in the first direction,
(h) a chuck on the steady for gripping the workpiece supported by the workpiece supports,
(i) rotary drive means operable to rotate the chuck and constituting the only means for rotating the workpiece supported by the workpiece supports, and
(j) means for moving the tool slide in the second direction in dependence on the rotation of the chuck.

4,215,605

FLOATING WORK DRIVER CHUCK

Paul Toth, Allen Park, and Kenneth O. Cross, Northville, both of Mich., assignors to N. A. Woodworth Company, Detroit, Mich.

Filed Nov. 3, 1978, Ser. No. 957,470
Int. Cl.[2] B23B 31/30, 33/00
U.S. Cl. 82—40 R 17 Claims



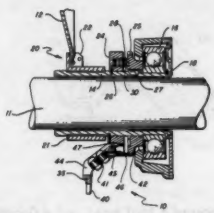
1. A work driver chuck comprising a rotatable body;
a work holding assembly carried by said body including a face plate mounted for limited free floating universal radial and angular movement relative to said body,
circumferentially spaced cam jaws having pivot shafts journaled in said face plate and movable about said pivot shafts into and out of clamping engagement with a workpiece in said chuck,
a pressure plate reciprocally movable on said pivot shafts toward and from said face plate, and
first actuator means operable in response to reciprocable movement of said pressure plate in one direction to turn said pivot shafts in a direction to engage said cam jaws with said workpiece and in response to movement thereof in the other direction to turn said pivot shafts in a direction to disengage said cam jaws from said workpiece;
second actuator means for reciprocally driving said pressure plate; and
means rotatably drivingly connecting said body and said work holding assembly.

4,215,606

FRANGIBLE STRIP OF CLIPS AND METHOD OF MAKING IT

John P. Britt, Chelmsford, England, assignor to Pinna Corporation, Dallas, Tex.

Filed Nov. 6, 1978, Ser. No. 957,672
Claims priority, application United Kingdom, Nov. 21, 1977, 48432/77
Int. Cl.[2] B26D 3/00
U.S. Cl. 83—23 13 Claims



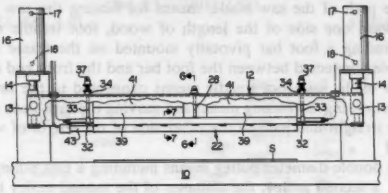
1. A method of forming lines of definition to delimit individual clips in a strip of clips from essentially flat plastic material without removal of material which includes forming the separation line by shearing the material of the strip between opposed shearing tools characterized in that the shearing is carried out while bowing the strip about a longitudinal axis on one of the tools to present a curved surface to the other of the tools, the said other tool being oppositely curved with respect to that surface, and closing the tools together to shear through the material of the strip to the extent, laterally of the strip, that the two curves intersect in the closed condition of the tools, the strip being bowed to curve the surface which is presented to the oncoming tool to be convex with respect to that tool, the oncoming tool also being convex with respect to that surface whereby the line of shear is initiated at a central portion of the width of the strip and extended towards its lateral edges to define a pair of said breaking portions, and including moving holding and stripping elements during the closing together of the tools from a first position in which they are just clear of a plane tangential to the mid-line of the convex tool with which they are associated, to a second position in which they are substantially at the mid-plane of intersection of the convex tools, and holding the material between these elements and a planar pressure surface associated with the other of the tools in such a manner as to permit apparent lateral contraction of the strip between the tools, and returning the holding and stripping elements to their first position during relative retraction of the tools.

4,215,607

APPARATUS FOR HEAT CUTTING SHEET MATERIAL

Wilber G. Hudson, and Ronald B. Welch, both of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed May 22, 1978, Ser. No. 908,398
Int. Cl.[2] B26D 7/10
U.S. Cl. 83—111 6 Claims



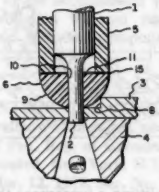
1. In apparatus for heat severing sheet material,
(a) an elongated knife-like sheet severing member having a sheet contacting edge,
(b) means to apply heat to the knife-like member comprising an electric resistance element encased in a metal sheath, said sheath being in intimate contact with an edge of the knife-like member opposite its sheet contacting edge,
(c) a frame for the knife-like member mounted for movement toward and from a sheet to be severed,
(d) means mounting the knife-like member in the frame with its sheet contacting edge projecting from the frame,
(e) said mounting means supporting the knife-like member including a member operatively connected to the knife-like member adjacent its longitudinal midpoint, and
(f) means adjacent the ends of the knife-like member operatively connected to and supporting the same from the frame while permitting unrestrained axial expansion of the knife-like member when heated.

4,215,608

PUNCH STRIPPER

Alton G. Herlan, Amherst, N.Y., assignor to Pivot Punch Corporation, Lockport, N.Y.

Filed Nov. 2, 1978, Ser. No. 956,920
Int. Cl.[2] B26F 1/14
U.S. Cl. 83—139 7 Claims



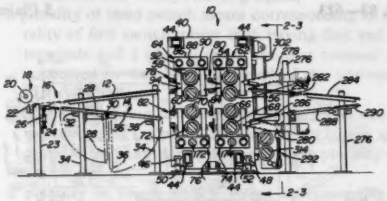
1. A stripper end portion disposed at the end of a resilient stripper member surrounding a punch for stripping a punched workpiece therefrom subsequent to pressing said workpiece against a flat die so as to prevent distortion of the workpiece at the area immediately surrounding the punch area, characterized in that:
said end portion is profiled to taper in toward the punch in the direction of the workpiece to form a substantially hemispherical external end surface, whereby the area of contact between said stripper end portion and said workpiece is at a minimum at both first and last moments of contact between said end portion and said workpiece and whereby maximum stripping pressure is exerted by said end portion on said workpiece immediately adjacent to said punch.

4,215,609

SLITTER SCORER HAVING UPPER AND LOWER PAIRS OF SHAFTS SELECTIVELY ROTATED BY A SINGLE DRIVE

Robert E. Coburn, Warminster, and Benedict R. Buinewicz, Villanova, both of Pa., assignors to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Feb. 9, 1979, Ser. No. 10,559
Int. Cl.[2] B26D 3/08, 11/00
U.S. Cl. 83—492 6 Claims



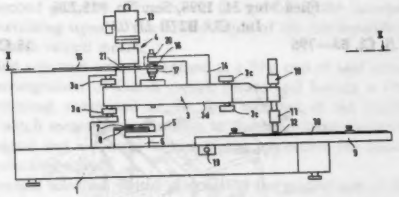
1. A slitter scorer comprising:
(a) first and second upright side frames, each side frame having an upstream end and a downstream end,
(b) an upper pair of rotatable slitter shafts downstream from an upper pair of scorer shafts, a lower pair of rotatable slitter shafts downstream from a lower pair of scorer shafts, said pairs of shafts being supported by said side frames, mating pairs of blades on each of said pairs of shafts, said upper pairs of shafts defining an upper web path, said lower pairs of shafts defining a lower web path,
(c) a single motor supported by said first side frame and coupled by a train of gears on said first side frame to said pairs of shafts for driving all pairs of shafts, clutch means associated with each pair of shafts so that said motor may selectively drive all pairs of shafts, only the upper pairs of shafts or only the lower pairs of shafts.

4,215,610

APPARATUS FOR PERFORATING A FOIL

Alfred Lemmer, Machtlfingerstrasse 24, D-8000 Munich 70, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,615
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717317
Int. Cl.[2] B26D 7/02; H05K 3/06
U.S. Cl. 83—565 12 Claims



1. Apparatus for perforating a foil for the purpose of producing an image carrier for a component-mounting pattern adapted to be projected onto a printed wiring board to which components are to be attached, said apparatus comprising a foil holder, a perforating device which may be operated for perforating foil held by said foil holder, means mounting said foil holder and perforating device to move relative to each other, fixing means for immobilizing movement of the perforating device relative to the foil holder at least during operation of said perforating device and means for delaying operation of

said perforating device until said fixing means has immobilized movement of said perforating device.

4,215,611

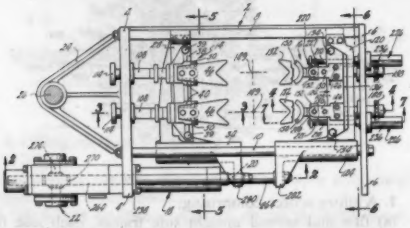
APPARATUS FOR STRAIGHT LINE SHEARING

Francis A. Dahms, Tariffville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Division of Ser. No. 876,086, Feb. 8, 1978, Pat. No. 4,174,647. This application Feb. 21, 1979, Ser. No. 13,481

Int. Cl.² C03B 5/38

U.S. Cl. 83—623 **5 Claims**



1. An apparatus for use with a feeder for shearing gobs from a column of plastic material comprising:

(a) at least one set of oppositely disposed shear blades movable in a straight line toward and away from each other between open and shearing positions;

(b) pneumatic cylinder assembly means including a piston member and an operating rod movable by fluid pressure between open and shearing positions for driving said shear blades between their open and shearing positions;

(c) means connecting said pneumatic fluid to a source of fluid pressure to move said piston member between its open and shearing positions;

(d) means for controlling the flow of fluid to said piston including normal return actuating means driven by said operating rod to initiate the return of said piston member from its shearing position to its open position after said shear blades have moved to their shearing position; and

(e) automatic return means for effecting return of said piston member to said open position in the event said shear blades do not travel completely to the shearing position to enable the normal return actuating means to initiate the return.

4,215,612

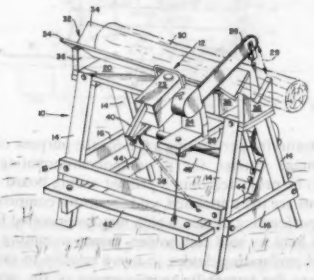
SUPPORT APPARATUS FOR CHAIN SAW

James R. Peel, Rte. 2, Box 1113, Franklin, N.C. 28734

Filed May 31, 1978, Ser. No. 911,226

Int. Cl.² B27B 17/02

U.S. Cl. 83—796 **15 Claims**



1. A chain saw apparatus for supporting a chain saw of the type having a body with a handle attached thereto and a blade extending outwardly from the body with a toothed cutting chain mounted on the blade, said support apparatus comprising a support frame, means for movably mounting a chain saw on the frame to enable the chain saw blade to move in a substantially straight-line path relative to the frame, the frame including a bed for supporting a length of wood within the straight-line path of the saw blade, means for biasing the saw blade toward one side of the length of wood, foot treadle means including a foot bar pivotally mounted on the frame and a cable connected between the foot bar and the front end of the saw blade, said foot treadle means connected to the saw for overcoming the biasing means and moving the saw blade along the straight-line path to the other side of the length of wood, and

a double-diameter pulley means including a first pulley and a second pulley, the diameter of the second pulley larger than that of the first pulley, the first and second pulleys rotatably mounted on the frame and connected to one another to rotate together, the cable portion connected to the foot bar being wound around and connected to the smaller diameter pulley and the cable portion connected to the saw blade being wound around and connected to the larger diameter pulley.

4,215,613

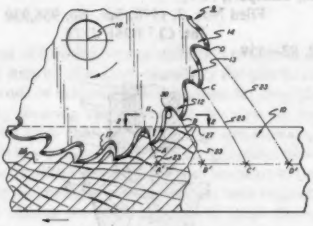
SLITTING APPARATUS

Eric A. Anderson, Port Townsend, Wash., and Walter A. Maier, Syracuse, N.Y., assignors to Eric A. Anderson, Part Townsend, Wash.

Filed May 1, 1978, Ser. No. 901,601

Int. Cl.² B26D 3/08

U.S. Cl. 83—864 **10 Claims**



4. Apparatus for slitting a workpiece that includes

at least one circular slitter blade having a plurality of teeth formed about its periphery and further having a continuous knife-edge formed about the entire periphery that lies in the midplane of the blade,

drive means for moving the blade and a workpiece through a work zone at equal speeds whereby each tooth on the blade moves toward the work along a cycloidal path of travel,

each tooth on the blade having a point that lies upon a radial line of the blade with the two side edges of the tooth which form the point being situated behind the radial line in regard to the direction of blade movement whereby the point of each tooth penetrates the work generally perpendicular to the work and the trailing edge of each tooth completely enters the work only after the point of the following tooth has penetrated the work.

4,215,614

ELECTRONIC MUSICAL INSTRUMENTS OF HARMONIC WAVE SYNTHESIZING TYPE

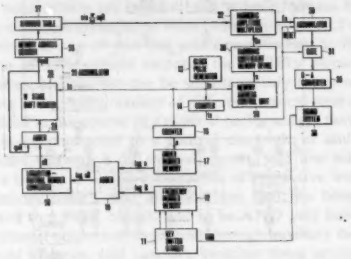
Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 30, 1978, Ser. No. 964,946

Claims priority, application Japan, Dec. 13, 1977, 52-148857

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **3 Claims**



1. In an electronic musical instrument of the harmonic wave synthesizing type wherein the harmonic components of a musical tone are generated, the harmonic components are multiplied with corresponding amplitude coefficients respectively, and the multiplication products are added together to synthesize the musical tone, the improvement which comprises a plurality of key switches for determining the pitch of the musical tone, frequency number generating means which generates a frequency number corresponding to a designated key switch, harmonic order number generating means which generates a harmonic order number representing the order of each harmonic component, an arithmetic processing means capable of multiplying integral and non-integral factors to obtain a multiplication product of said frequency number and said harmonic order number, accumulating means for repeatedly accumulating the output of said arithmetic processing means for respective harmonic orders at a predetermined speed, and sine function generating means including a memory device which stores the amplitude values at respective sampling points of a sinusoidal wave for generating said amplitude values of the sinusoidal wave corresponding to respective ones of said harmonic components in response to the accumulated values of respective harmonic orders produced by said accumulating means, thereby producing said harmonic components.

4,215,615

MONOLITHIC INTEGRATED SELECTION CIRCUIT

Dieter Holzmann, Freiburg-Munzingen, and Dirk Hoffmeister, Mahlberg, both of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,395

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812185

Int. Cl.[2] G10H *1/00*; H04Q *3/00*

U.S. Cl. 84—1.01 **3 Claims**

1. A monolithic integrated selection circuit for selecting the uppermost or the lowermost valued signal from a plurality of signals selected from a sequence of electrical signals, each said signal being selected by the activation of one key switch associated with said signal, either the uppermost or lowermost signal being selected in accordance with a binary selecting signal, said circuit comprising:

a first plurality of inputs, each being adapted to receive one of said sequence of electrical signals;

a second plurality of inputs corresponding to the first plurality of inputs, each input being adapted to receive a switching signal from the key switch associated with said electrical signals;

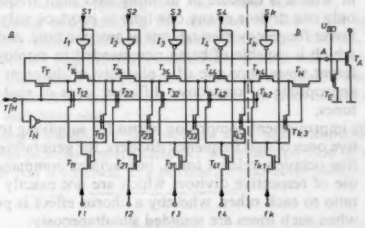
a plurality of first switch means each having first and second terminals and a control input, the first terminal thereof connected to one of said first plurality of inputs and the control input connected to the corresponding one of said second plurality of inputs;

a plurality of second switch means corresponding to the plurality of first switch means, each having first and second terminals and a control input, the first terminal thereof connected to the second terminal of the corresponding first switch means and the control input adapted to receive said binary selecting signal;

a plurality of third switch means corresponding to the plurality of first switch means each having first and second terminals and a control input, the first terminal thereof connected to the second terminal of the corresponding first switch means;

means for receiving said binary selecting signal and inverting said signal for providing an inverted binary selecting signal to the control inputs of each of the plurality of third switch means;

a plurality of fourth switch means corresponding to the plurality of first switch means, each having first and second terminals and a control input, the first and second terminals of separate switch means being connected to form a series arrangement, the second terminal of the corresponding second switch means being connected to



the first terminal of the corresponding fourth switch means and the second terminal of the corresponding third switch means being connected to the second terminal of the corresponding fourth switch means;

means for inverting the switching signals received at the second plurality of inputs and for providing the inverted switching signal to the control input of the corresponding fourth switch means;

a first selection switch disposed at a first end of said series arrangement of fourth switch means and having a first terminal connected to the first terminal of the fourth switch means corresponding to the lowermost electrical signal and a control input adapted to receive the binary selecting signal;

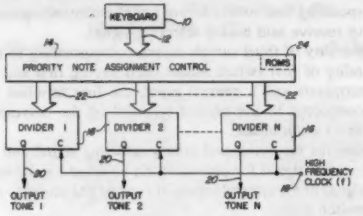
a second selection switch disposed at the second end of the series arrangement of fourth switch means and having a first terminal connected to the second terminal of the fourth switch means corresponding to the uppermost electrical signal and having a control input adapted to receive the inverted binary selecting signal; and

an output terminal connected to the second terminals of the first and second selection switches, whereby in accordance with the binary selecting signal, either the uppermost or lowermost electrical signal of those selected in accordance with the inputs received at the second plurality of inputs are provided at the output.

4,215,616
ASYNCHRONOUS TONE GENERATOR

Glenn M. Gross, Chicago, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed May 24, 1979, Ser. No. 42,021
Int. Cl.[3] G10H *1/02, 5/06*
U.S. Cl. 84—1.01 **23 Claims**



1. In a tone generator of the type having:

a high frequency clock source which is employed as a common frequency standard for generating each one of a plurality of musical tones over a range of more than one octave;

and a plurality of variable divisor frequency dividers each of which is connected to receive at any one time only a single frequency input, said frequency input being derived from the high frequency output of said clock source, and each of which is capable of dividing said high frequency by only one divisor at any one time to produce only a single lower frequency musical tone at any one time, and each of which is capable of being commanded to employ, at different times, any one of a plurality of different divisors appropriate to respective different ones of said musical tones;

the improvement comprising means for supplying to respective ones of said frequency dividers, for generating respective octavely related tones, instructions commanding the use of respective divisors which are not exactly in a 2:1 ratio to each other, whereby a chorus effect is produced when such tones are sounded simultaneously.

4,215,617
MUSICAL INSTRUMENT AND METHOD FOR GENERATING MUSICAL SOUND

James A. Moorer, Saratoga, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Palo Alto, Calif.

Filed Nov. 22, 1976, Ser. No. 743,612
Int. Cl.[2] G10F *1/00*
U.S. Cl. 84—1.03 **16 Claims**

1. A musical instrument for producing musical sound comprising,

a keyboard for specifying a frequency and duration of a musical sound to be generated,

an initial data memory storing initial data and responsive to the keyboard for initializing the musical instrument,

a spectral control unit for storing a time-varying spectral index,

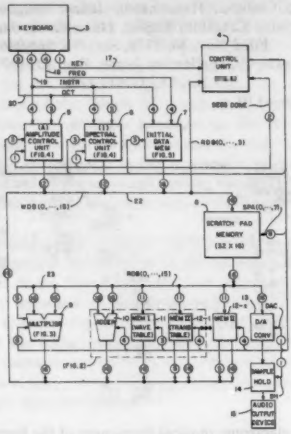
an amplitude control unit for storing a time-varying amplitude index,

a first function memory for storing data for a first function,

a second function memory for storing data for a second function when said second function is non-linear and is different from said first function,

arithmatic means for combining signals from said memories and units,

control means for providing control signals to said memories, units and arithmatic means in accordance with a control sequence to produce periodically digital signals as the non-linear transformation of said first function by said second function and where said digital signals specify an amplitude controlled by said amplitude index and a frequency spectra controlled by said spectral index,

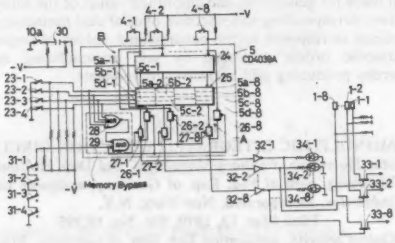


means for generating musical sound in response to said digital signals whereby the musical sound has an amplitude and component frequencies determined by the amplitude and frequency spectra of said digital signals.

4,215,618
APPARATUS FOR PRESETTING MUSICAL TONE EFFECTS IN ELECTRONIC MUSICAL INSTRUMENT

Nobuo Kamikawa, Ageo, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Jan. 11, 1978, Ser. No. 868,716
Claims priority, application Japan, Jan. 17, 1977, 52/2984; Jan. 17, 1977, 52/2985
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.24 **1 Claim**



1. An arrangement for presetting musical tone effects in an electronic musical instrument, comprising: a first system having plural tablet switches, respective memory elements in a memory circuit, plural gates with respective control electrodes, said plural tablet switches being connected to respective memory elements in said memory circuit to control respective electrodes of said plural gates for selection of musical tone effects; a second system having said tablet switches connected to control electrodes of plural gates for selection of musical tone effects; selection means for selecting either one of the first system and the second system; said memory circuit having a write switch and being so arranged that after completion of writing output signals of respective tablet switches by operation of said write switch the memory contents remain unchanged until said write switch is operated again; plural line

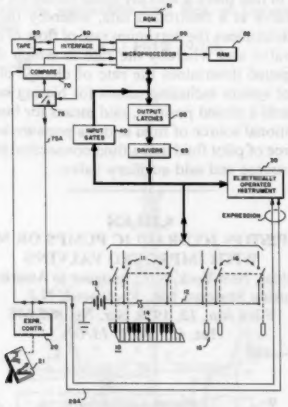
selection switches; said memory elements in said said memory circuit of said first system being arranged in plural lines; said plural line selection switches selecting the respective lines of said memory elements; said selection means having plural gates for opening said first system and closing said second system when said line selection switches are selectively operated, said memory circuit comprising further a random-access memory having input gate means, memory means connected to output means of said input gate means, transmission gate means connected to output means of said memory means; and indicating means arranged to be operated when said gates for selection of musical tone effects are opened; said memory means having memory elements arranged to form plural lines, each of which corresponds to one of said line selection switches, so that by operation of each of said switches the memory elements in each corresponding line can be simultaneously taken out for providing an increased variety of different musical tone effects to be added in the course of a musical performance, said write switch being connected to a control electrode of said input gate means through a differential circuit, said line selection switches being connected to terminals of respective words of said memory means, said line selection switches being also connected to a NOR circuit, and to an AND gate having an input terminal connected to ground through auxiliary switches connected in series, said auxiliary switches being arranged to be opened by closing the line selection switches.

4,215,619

SYSTEM FOR RECORDING AND AUTOMATIC PLAYBACK OF A MUSICAL PERFORMANCE

Gerald A. Budelman, Aloha, Oreg., and James A. Turner, Stamford, Conn., assignors to CBS Inc., New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,625
Int. Cl.[2] G10H *1/02, 5/00*
U.S. Cl. 84—1.28 **68 Claims**



1. A musical keyboard instrument having an automatic playing capability, comprising:

a keyboard which includes a plurality of keys;

musical tone generators associated with said keys;

means for sensing, at a sensing time, which of the keys are activated;

means for generating a sequence of frames, each frame including digital information representative of the keys which are activated at a given sensing time, the duration of each frame being a function of the relative locations of the keys activated at the given sensing time;

each said sensing time being determined by the previously completed frame;

means for storing sequences of said frames;

means for reading out stored sequences of frames;

means for decoding the information in the read out frames; and

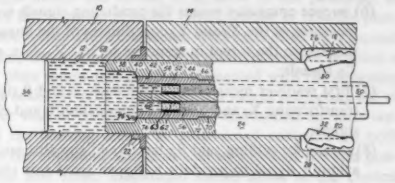
means for activating the tone generators in accordance with the decoded information.

4,215,620

IGNITION DEVICE

Douglas P. Tassie, St. George, Vt., and Robert A. Pustell, Andover, Mass., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 723,367, Sep. 15, 1976, Pat. No. 4,085,653. This application Nov. 9, 1977, Ser. No. 849,736
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—1 R **7 Claims**



1. A process for the manufacture of an igniter comprising:

providing an assembly of an outer tube of conductive metal, an inner rod of a conductive metal, and an intermediate volume of irregular particles of metal oxide mineral dielectric material spacing said rod within said tube;

compressing and reducing the diameter of the outer tube radially about said intermediate volume and the rod to remove all voids in said intermediate volume and to interlock and imbed said particles of said intermediate volume with each other and the adjacent metal surfaces of said rod and said tube; and

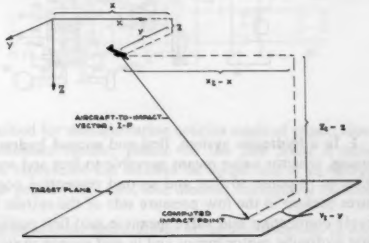
removing a portion of said volume after said compressing step to provide a spark chamber wherein a portion of said inner rod is exposed to a portion of said outer tube.

4,215,621

TARGET MARKER PLACEMENT FOR DIVE-TOSS DELIVERIES WITH WINGS NONLEVEL

John S. Ausman, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 7, 1978, Ser. No. 967,329
Int. Cl.[3] B64D *1/04*
U.S. Cl. 89—1.5 E **4 Claims**



1. In an aircraft having a bombing system, means for assisting the pilot to control a bomb to drop it on a target, comprising:

(1) air density computer means for producing signals which are a measure of air density ρ and true air speed in response to barometric air pressure, ram air pressure, and temperature signals;

(2) means for producing signals which are measures of verti-

cal and horizontal velocity component signals Z, V_x, V_y of the aircraft and vertical and horizontal components of the aircraft's position, x, y, z relative to the target, θ, ϕ, ψ and δ, including means responsive to X_T, Y_T signals which are measures of earth coordinates of the target relative to the aircraft position at time of target designation;

(3) ballistic computer means for producing signals which are a measure of R_B, t_f, T_R, and γ_I in response to Z, V_y, V_x, C_DA/M and g signals;

(4) F computer means for producing a signal which is a measure of F in response to R_B, Z, Z, γ_I and ground speed signals;

(5) a sight cross-axis computer means for producing a signal which is a measure of $\theta_T \tan(\phi_I - \phi)$ in response to F, ϕ and θ_T signals;

(6) impact computer means for producing signals which are measures of the X_I and Y_I coordinates of the impact point relative to the target in response to V_x, V_y, δ, x, y, t_f and T_R signals;

(7) first resolver means responsive to ϕ, ψ and θ signals for transforming X_I and Y_I into pipper azimuth and elevation signals;

(8) means for adding said $\theta_T \tan(\phi_I - \phi)$ signalto said pipper azimuth signal to produce a pipper cross-axis placement signal;

(9) means for adding a θ_T signal to said pipper elevation signal to produce a pipper vertical placement signal;

(10) second resolver means responsive to θ, ψ, ϕ, baro-altitude of aircraft, target baro-altitude, said pipper cross axis placement and pipper vertical placement signals to produce said X_T, Y_T, Z_T signals; and

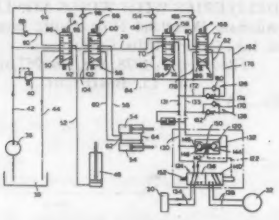
(11) means for producing a signal to release a bomb when $X_I^2 + Y_I^2$ is minimum.

4,215,622

HYDRAULIC CONTROL SYSTEM

Willard L. Chichester, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sep. 22, 1978, Ser. No. 944,828
Int. Cl.² F15B *11/16*
U.S. Cl. 91—508 **4 Claims**



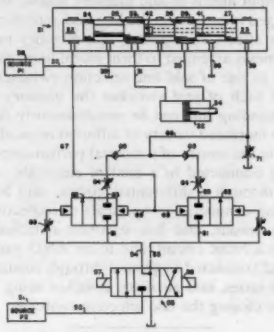
1. In a hydraulic system, first and second hydraulic motor means, selector valve means movable to first and second positions in response to first and second respective control pressures present in the low pressure side of the system for operatively connecting said valve means in said first position to said first hydraulic motor means and in said second position to said second hydraulic motor means, and operator valve means adapted to select the operation of said first or second motor means and to establish said first or second control pressure, said operator valve means being remote from said motor means and selector valve means and connected across the remote spacing thereof by two hydraulic conduits only, the operator valve means including a pair of independently operable directional control valves for controlling the respective direction of operation of said first and second hydraulic motor means.

4,215,623

HYDRAULIC VELOCITY AND ACCELERATION CONTROL SYSTEM

James O. Byers, Jr., Manchester, N.H., assignor to Sanders Associates, Inc., Nasua, N.H.

Continuation of Ser. No. 231,212, Mar. 2, 1972, abandoned. This application Apr. 12, 1978, Ser. No. 895,692
Int. Cl.² F15B *13/042*; F16K *11/00*
U.S. Cl. 91—461 **4 Claims**



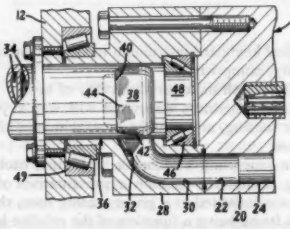
1. A control system for controlling the rate of flow of fluid and the rate of change of such flow to a load which system includes a main valve adapted to be connected to supply fluid to a load, said valve being of the kind in which the rate of flow of fluid to the load is proportional to the rate of flow of pilot fluid to the valve CHARACTERIZED in that there is provided a source of pilot fluid, an auxiliary valve and a restrictor serially connected between a source of pilot fluid and said main valve, and in that there is also provided means for opening said auxiliary valve at a controlled rate, whereby the size of the restrictor determines the maximum rate of flow of pilot fluid to the main valve and whereby the rate at which the auxiliary valve is opened determines the rate of change of such flow, said control system including means for biasing said auxiliary valve towards a closed position, said means for biasing including an additional source of fluid under a pressure less than that of said source of pilot fluid and a fluid connection between said additional source and said auxiliary valve.

4,215,624

AXIAL PISTON HYDRAULIC PUMPS OR MOTORS WITH IMPROVED VALVING

Jaromir Tobias, New York, N.Y., assignor to American Hydraulic Propulsion Systems, Inc., Englewood, N.J.

Filed Apr. 12, 1978, Ser. No. 895,645
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **2 Claims**



1. In an axial piston hydraulic pump or motor which includes a rotatable cylinder barrel having a multiplicity of axially extending cylinders spaced apart circumferentially from each other and radially from the axis of a main shaft on which the

barrel is mounted, the improvement comprising an internal circular cylindrical bore in the barrel, the bore being coaxial with the axis of the main shaft, a multiplicity of charge-discharge passages in the barrel, one such passage communicating with each cylinder at one end and opening at the other end through at least two ports in the circumferential wall of the bore, and each such passage being of substantially uniform cross-sectional area along its entire length from the ports to the cylinders, which area is substantially equal to the cross-sectional area of the corresponding cylinder, a non-rotatable pintle shaft received in the bore, the pintle shaft having supply and return passages opening to charge and discharge areas which communicate through charge and discharge ports in the circumferential wall of the shaft that are substantially coextensive with the zones swept by the ports in the barrel and are separated by diametrically opposite bridges which serve as valves to open and close sequentially communication between the respective charge and discharge ports in the pintle shaft and each port in the bore of the barrel to separate the charge and discharge stages of each cycle of operation of each cylinder, a journal-thrust bearing interposed between the pintle shaft and cylinder barrel for rotatably supporting and stabilizing the barrel on the pintle shaft and a journal-thrust bearing interposed between the barrel and a housing member adjacent the end of the barrel remote from the main shaft, whereby true running of the barrel on the pintle is ensured for effective sealing and lubrication of the interfaces between the barrel and pintle.

4,215,625

ADJUSTING ACTUATION OPERATED BY PRESSURE MEDIUM

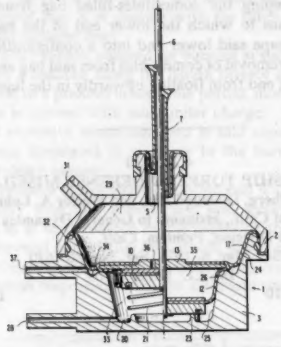
Rudiger Hoffmann, Sindelfingen, and Dieter Feichtiger, Grafenau, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 7, 1977, Ser. No. 831,143

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 2640561

Int. Cl.² F01B *19/00*

U.S. Cl. 92—48 **21 Claims**



1. A pressure-medium operated adjusting drive, comprising a housing means, a first roller diaphragm means displaceable in said housing means by a pressure medium and operatively connected with a plurality of individual plate means, an adjusting member securely connected with a first of the plurality of individual plate means and extending out of the housing means, said adjusting member being actuated in an adjusting direction by said first roller diaphragm means, said adjusting member having two end positions and at least one intermediate position, characterized in that a second roller diaphragm means is provided for respectively connecting each of the plurality of plate means to each other, a second of said plurality of plate means is nondirectly connected with the adjusting member, an abutment means projects out of an inner wall of the housing means, in the intermediate position the nondirectly connected plate means sealingly rests on the abutment means, and in that the abutment means is rounded-off and includes an undercut, and characterized in that a seal between the second plate means and the abutment means results when said second plate means sealingly rests on the abutment means, said seal is formed by the first roller diaphragm means.

10. A pressure-medium adjusting drive, comprising a housing means, a first roller diaphragm means displaceable in said housing means by a pressure-medium and operatively connected with a plurality of individual plate means, an adjusting member securely connected with a first of said plate means and extending out of the housing means, said adjusting member being actuated in an adjusting direction by said first roller diaphragm means and having in addition to end positions, at least one intermediate position, characterized in that the plate means are respectively connected with each other by a second roller diaphragm means, in that in the intermediate position a second plate means non-directly connected with the adjusting member sealingly rests on an abutment means projecting out of the inner wall of the housing means, and in that an inner surface of the housing means is constructed conically on both sides of the abutment means so that in a first of the end positions the first roller diaphragm means abuts at the conical surface on one side of the abutment means while the second roller diaphragm means abuts at the conical surface on the other side of the abutment means.

4,215,626

METHOD AND APPARATUS FOR MANUFACTURING ARTICLES MADE OF PAPER FROM A PLURALITY OF PRE-PERFORATED STRIPS

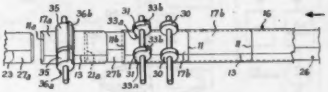
Louis Giulianotto, Alfortville, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Feb. 28, 1978, Ser. No. 882,110

Claims priority, application France, Mar. 3, 1977, 77 06207

Int. Cl.² B31B *1/10, 1/14*

U.S. Cl. 93—94 R **9 Claims**



1. A method for manufacturing articles made of paper, tissue paper, cellulosic matter, plastic or the like from n strips wherein n represents the number of strips and is an integer equal to or greater than two, said method comprising the steps of,

forming transverse perforations at regular intervals in each strip to define in each strip a plurality of elementary sections having the same length L,

superimposing said perforated strips such that each perforated strip is offset, in the longitudinal direction, with respect to an adjacent strip, by a distance equal to L/n, and thereafter,

exerting successively and independently on each of the successively superimposed strips a pulling and tear-off action to divide the longitudinally offset, superimposed perforated strips into separate elementary sections.

4,215,627

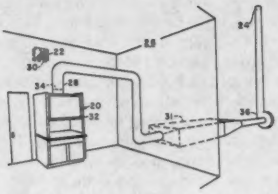
ENERGY CONSERVING LABORATORY HOOD SYSTEM

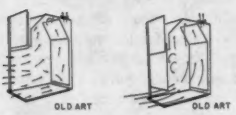
John E. Garriss, 1325 E. Northern Parkway, Baltimore, Md. 21239

Continuation-in-part of Ser. No. 909,532, May 25, 1978, Pat. No. 4,155,289. This application Dec. 29, 1978, Ser. No. 16

Int. Cl.³ F23J *11/00*

U.S. Cl. 98—115 LH **3 Claims**





1. A method for producing constant-velocity flow of varying-pressure ambient gas through an access opening of a laboratory hood space having an exhaust for throughput and a closure for adjusting the area of the access opening, comprising the steps:

(a) throttling throughput at the exhaust in predetermined relation to said area adjustment of the access opening, and

(b) modifying said throttling of throughput at the exhaust in proportion to said variations in pressure of the ambient gas, thereby producing said constant flow through the access opening of a laboratory hood space.

4,215,628

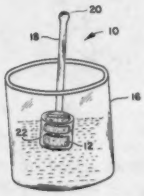
INFUSION AND STIRRING DEVICE

William A. Dodd, Jr., 2707 Foxfire Ct., Clearwater, Fla. 33515

Filed Aug. 18, 1978, Ser. No. 934,900

Int. Cl.² A47J *31/18*

U.S. Cl. 99—323 **6 Claims**



1. An improved infusion and stirring device comprising in combination:

a handle member having a first and a second portion;

each of said handle member portions comprising a longitudinally extending beam having a substantially constant cross sectional area;

a first and a second retaining element respectively secured to said first and second portions of said handle member for stirring an infusion liquid upon movement of said handle member;

each of said first and second retaining elements comprising at least an arm extending perpendicularly relative to said longitudinally extending beam;

a hinge interposed between said first and second portions of said handle member enabling said first and second retaining elements to engage opposed sides of a porous bag containing an infusion solid; and

a latch interconnecting said first and second portions of said handle member for retaining the porous bag between said first and second retaining elements.

4,215,629

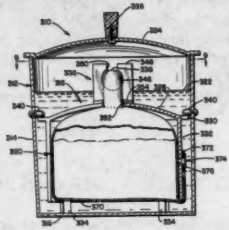
COOKING UTENSILS

Alexander P. Janssen, 28 Old Farm Rd., Bellair Charlottesville, Va. 22903

Continuation-in-part of Ser. No. 327,658, Jan. 29, 1973, Pat. No. 3,946,654. This application Jan. 16, 1976, Ser. No. 649,680

Int. Cl.² A47J *27/10*

U.S. Cl. 99—403 **6 Claims**



1. The combination of a cooking utensil for comestibles and a disposable bag for holding the comestibles to be cooked, said utensil comprising a container and means engageable with the comestibles-filled bag to hold said bag in said container and keep it from floating so that said bag can be submersed in a liquid in said container to cook the comestibles in said bag, the means for keeping the comestibles-filled bag from floating including means to which the lower end of the bag can be attached to shape said lower end into a configuration which facilitates the removal of comestibles from said bag and to keep said lower bag end from floating upwardly in the liquid in said container.

4,215,630

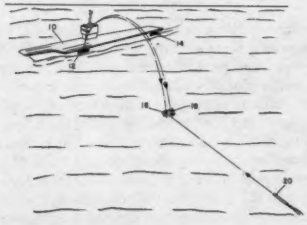
ANTI-SHIP TORPEDO DEFENSE MISSILE

Allen C. Hagelberg, Diamond Bar, and Walter A. Lobitz, Westwood, both of Calif., assignors to General Dynamics Corporation Pomona Division, Pomona, Calif.

Filed Mar. 6, 1978, Ser. No. 883,620

Int. Cl.³ F42B *22/04*

U.S. Cl. 102—10 **15 Claims**



1. An anti-torpedo defense system, said system comprising in combination:

detecting means for detecting and locating an incoming threat;

missile launching means including a fire control system responsive to said detecting means for launching at least one warhead carrying missile in the path of the incoming threat, said missile having buoyancy control means for controlling the depth of said missile in a body of water, and

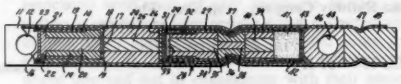
an active fuze system including target sensing and tracking means carried by said missile for detonating the warhead at the optimum proximity of an incoming threat thereto.

4,215,631

SEALED PYROTECHNIC DELAY

Klaus G. Rucker, Kinnelon, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1971, Ser. No. 119,033
Int. Cl.³ F42B *3/10*
U.S. Cl. 102—27 R **17 Claims**



1. A pyrotechnic delay device, comprising in combination:

an elongated tubular housing of predetermined length;

means disposed in one end of said housing adapted for effectively attaching an input detonating cord thereto;

first explosive means located within said housing in such proximity to said first detonating cord as to be detonated by the detonation thereof;

a resilient disc disposed within said housing, with one of the faces thereof effectively in contact with said first explosive means;

a capsule disposed within said housing, with one end thereof in contact with the other face of the aforesaid resilient disc;

an igniter charge located within said capsule adjacent to the end thereof that is in contact with the other face of the aforesaid resilient disc;

a carrier delay means, adapted for burning at such a rate and for such a distance along the length thereof as to be proportional to a predetermined time period, mounted in said capsule in contact with said igniter charge;

a second explosive means disposed in said capsule adapted for being detonated in response to the burning of said carrier delay means;

a third explosive means disposed within said housing in such proximity with said capsule and said second explosive means as to be detonated by the explosion thereof; and

means disposed in the other end of said housing adapted for effectively attaching a second detonating cord thereto in contiguous disposition with the aforesaid third explosive means.

4,215,632

EXERCISE PROJECTILE, MORE ESPECIALLY OF THE DISCARDING SABOT TYPE

Swan L. Sie, Zaandam, Netherlands, assignor to Eurometaal N.V., Zaandam, Netherlands

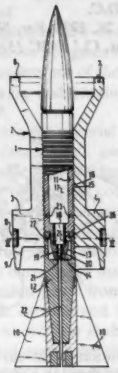
Filed May 16, 1978, Ser. No. 906,658
Int. Cl.² F42B *13/20*
U.S. Cl. 102—92.7 **10 Claims**

1. An exercise projectile comprising, in combination:

a projectile body having at least two parts provided with interengaging portions;

separable sabot means having plural components engaging said parts for connecting said parts prior to firing the projectile and for releasing said parts by separation of said components a short period of time subsequent to said firing; and

time delay connector means cooperating with said interengaging portions for establishing a temporary connection between said parts in response to said firing of the projectile, and including delay means for terminating said temporary connection subsequent to said short period of time.

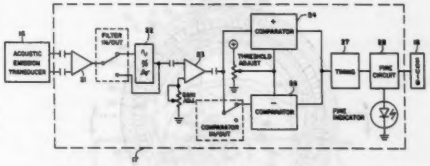


4,215,633

ACOUSTIC EMISSION CONTACT FUZE WITH SIGNAL PROCESSING CAPABILITY

Matthew E. Anderson, Ridgecrest; Timothy P. Zvada, Lake Isabella, and Jack T. Waller, Jr., China Lake, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1978, Ser. No. 912,680
Int. Cl.³ F42C *11/02*
U.S. Cl. 102—210 **10 Claims**



1. A detector to respond to impacts comprising;

transducer means attached to a vehicle for producing an electrical output upon receipt of acoustic emission stress waves;

filter means effectively connected to said transducer means and following said transducer means on the signal path to separate acoustic emission stress waves from other signals by frequency;

threshold means effectively connected to said filter means and following said filter means on the signal path to pass signals resulting from acoustic emission stress waves;

timing means connected to said threshold means and following said threshold means on the signal path to measure the coincidence of signals within a given time;

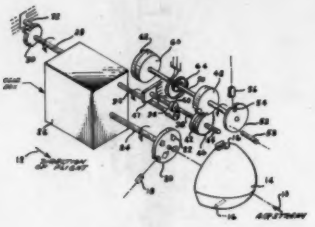
response means operatively connected to said timing means and following said timing means on the signal path.

4,215,634

MECHANICAL MUNITION FLIGHT ENVIRONMENT SENSOR

John D. Forsberg, Wayzata, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 26, 1978, Ser. No. 928,329
Int. Cl.[2] F42C *15/12*
U.S. Cl. 102—228 **3 Claims**



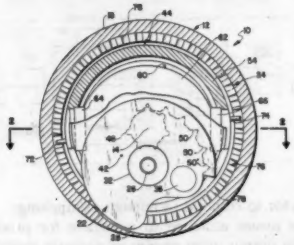
1. A mechanical munition flight environment sensor comprising: a shaft connected through a clutch means to an energy source; a rotor, having a plurality of grooves along the circumference thereof, mounted on one end of said shaft; a housing surrounding the rotor and having means to allow the said shaft to pass through; at least one recess in said housing having one end open facing the rotor and having one surface inclined to the longitudinal axis of the shaft; a ball housed in said recess to engage the grooved rotor of sufficient size to prevent relative movement between the rotor and the housing when seated in a rotor groove; spring means positioned along the shaft to bias a rotor groove into alignment with a recess and means for securing said housing to prevent rotational movement thereof.

4,215,635

SAFE AND ARMING DEVICE

Louis P. Farace, Pennsauken, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 14, 1978, Ser. No. 969,595
Int. Cl.[2] F42C *15/22*
U.S. Cl. 102—238 **18 Claims**



1. An improved safe and arming device for isolating a fuse from a main explosive charge in spin stabilized shells to prevent premature detonation of such shells, the improved safe and arming device comprising:

a housing adapted to be positioned intermediate of the fuse and the main explosive charge of such shells for rotation therewith about a shell spin axis when the shells are fired;

a rotor mounted in said housing for rotation about a rotor axis extending in a first direction, said rotor having detonation communication means for communicating a detonation signal from said fuse to said explosive charge only when said rotor is in an armed position, said rotor being positionable in a desired start position displaced from said armed position, said rotor being adapted to rotate from said start position to said armed position in response to rotation of said shell; and

rotation control means for controlling the rate of rotation of said rotor from said start position to said armed position, said rotation control means comprising:

a rotatable member engageable with said rotor for controlling the rate of rotation of said rotor, rotation of said rotatable member defining a circular path;

a delay member carried by said rotatable member for controlling the rate of rotation of said rotatable member; and

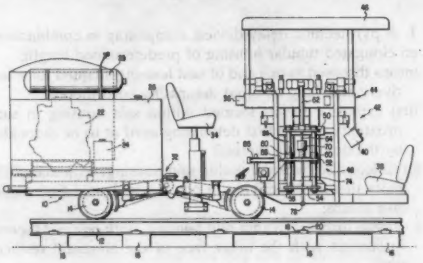
means for causing said delay member to follow a tortuous path as said rotatable member rotates which carries said delay member in and out of the plane of said circular path defined by rotation of said rotatable member.

4,215,636

MACHINE FOR ENGAGING AND ROTATING CONCRETE CROSSTIE BOLTS

Irving E. Smith, Jacksonville, Fla., assignor to Florida East Coast Railway Company, Augustine, Fla.

Filed Jun. 12, 1978, Ser. No. 914,544
Int. Cl.[2] E01B *29/28*
U.S. Cl. 104—17 R **9 Claims**



1. A machine for engaging the heads of bolts and rotating these bolts that are threadably engageable within a series of at least four apertures aligned along the length of a surface of a concrete crosstie which is adapted to support, on this surface, a pair of railroad rails in a predetermined spaced relationship, at least two pairs of these bolt-receiving apertures being disposed in spaced relationship so that each pair of apertures receives the base of an associated rail therebetween, each rail being secured to the crosstie by a pair of clips engaging the base of each rail and with each clip being secured to the crosstie by one of the bolts passing through the clip and into threadable engagement within an associated aperture, the machine having, in combination:

A. A frame supported for movement along the rails by rail-engaging wheels, a source of power carried on said frame and driving hydraulic pump means having a reservoir to provide a source of fluid under pressure, a pair of work heads carried by said frame and so disposed that each work head is in alignment, longitudinally, with an associated rail and is disposed above the rail;

B. Hydraulic drive means carried on said frame and operatively connected to each of said work heads, said hydraulic drive means selectively receiving fluid under pressure from a first hydraulic means, carried on said frame, to move said work heads, at a controlled rate of speed, in a direction back and forth and in a direction generally parallel to the rails and longitudinally thereof;

C. Second hydraulic drive means carried on each work head to selectively receive fluid under pressure from a second hydraulic means carried on said frame and being operatively connected to a portion of said work head to move this portion vertically up and down with respect to an

associated rail, each of said portions carrying a pair of hydraulic motor adapted to selectively receive fluid under pressure from a third hydraulic means, said motors driving downwardly extending spindles carrying at their lower ends sockets, corresponding in size with the heads of the bolts, which sockets are disposed in a spaced relation corresponding to the distance between the apertures receiving the bolts for the pair of clips, said second hydraulic means including adjustable bypass valve means that operates to maintain a predetermined down feed pressure on each socket after these sockets engage their respective bolt heads as said portion is urged down through operation of said second hydraulic drive means and said bypass valve means functions to further maintain this predetermine pressure during a subsequent downward or upward movement of said portion of said work head while said sockets are in engagement with the bolt heads; and

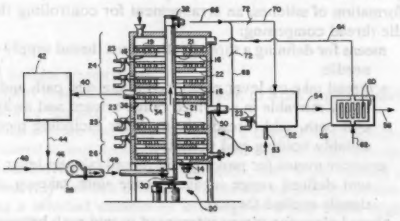
D. Said third hydraulic means being carried on said frame and selectively supplying fluid under pressure to said motors to rotate said sockets simultaneously in either a clockwise or a counter clockwise direction, said third hydraulic means including a hydraulic diversion system associated with each of said hydraulic motors, which system is selectably activated to divert a desired amount of fluid under pressure from its associated motor to said reservoir during that period of time said sockets are being urged into and out of engagement with their associated bolt heads, said third hydraulic means further including adjustable dual state relief valve means associated with each of said motors and operable in either direction of rotation of said sockets to limit to a predetermined amount the torque force applied to the respective bolt heads by an engaged socket, whereby all of said motors can be operated simultaneously.

4,215,637

SYSTEM FOR COMBUSTION OF WET WASTE MATERIALS

Luis A. Lombana, Belmont, Calif., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Apr. 2, 1979, Ser. No. 25,805
Int. Cl.³ F23G 5/04; F27B 9/22
U.S. Cl. 110—225 **11 Claims**



1. A system for drying and burning wet waste materials in a furnace having a hollow shaft rotatably mounted in its center, comprising:

a. a drying zone formed in the furnace to receive the wet waste materials;

b. means to introduce a stream of hot air into said drying zone to heat the wet waste materials and carry water vapor therefrom;

c. a burning zone formed in the furnace to receive dried sludge from the drying zone and to burn the dry sludge;

d. condenser means coupled in gas flow communication with said drying zone to receive hot, wet gases from said drying zone and to cool and condense water from the gases;

e. blower means coupled in flow communication with said condenser means to receive the cooled gases from said condenser means and to blow the cooled gases through the hollow shaft to cool the shaft and heat the gases;

f. conduit means coupled in flow communication with the shaft to receive heated gases blown through the shaft and to convey the heated gases into said burning zone for burning therein; and

g. an afterburner coupled in flow communication with said burning zone to receive hot gases from said burning zone and to raise the temperature of the hot gases.

6. A process for drying and burning wet waste material, comprising the steps of:

a. introducing the wet waste material into a drying zone of a furnace having a center shaft, and heating the material therein to drive water from the material

b. conveying a stream of hot gases containing water from the furnace to a condenser for removing water from the hot gases by cooling the hot gases;

c. transferring the dried waste material into a burning zone of the furnace and burning the material therein;

d. conveying the cooled gases from the condenser to the center shaft of the furnace and forcing the cool gases through the shaft to cool the shaft and heat the gases;

e. removing the heated gases from the shaft and transferring at least part of the gases to the burning zone of the furnace to provide air for combustion; and

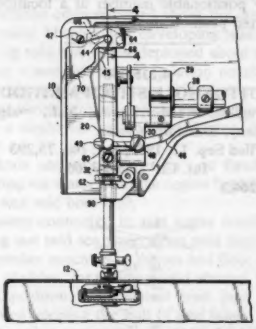
f. removing hot gases from the burning zone and conveying the hot gases to an afterburner for burning therein.

4,215,638

NEEDLE BAR SUSPENSION MEANS FOR A ZIG-ZAG SEWING MACHINE

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 12, 1978, Ser. No. 915,084
Int. Cl.² D05B 55/14
U.S. Cl. 112—221 **4 Claims**



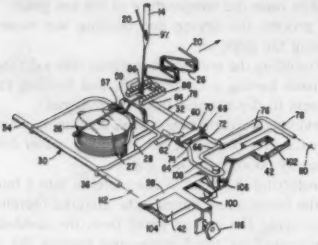
1. In a zig-zag sewing machine, the combination comprising, a needle bar, a needle affixed to the lower end of the needle bar, a needle bar supporting bracket having the needle bar mounted for reciprocation therein, a spherical bearing for the needle bar located between the upper and lower ends thereof and mounted for pivotal movement in the machine, and means mounting the needle bar supporting bracket at the upper end portion thereof for pivotal motion about mutually perpendicular axes which are also perpendicular to the longitudinal axis of the bracket, said means including a hole in the upper end portion of the needle bar supporting bracket with a shaft extending therein to define a primary pivotal axis for the bracket, feet on opposite sides of the longitudinal axis of said bracket and a fixed member which engages the feet and prevents the bracket from twisting about the said longitudinal axis.

4,215,639

SELECTIVELY CONTROLLABLE BOBBIN THREAD PULL-OFF MECHANISM

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Feb. 2, 1979, Ser. No. 9,021
Int. Cl.[2] D05B *27/22, 27/02*
U.S. Cl. 112—242 **4 Claims**



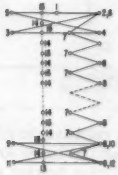
1. In a lock stitch sewing machine, mechanism for removing predetermined lengths of thread from a bobbin spool for use in the formation of stitches by a needle including fixed spaced walls between the bobbin spool and needle, a pivoted thread pulling bar having a leg movable between said walls for pulling thread looped under the leg and over said walls from the bobbin spool and into the space between the walls during pivotal movement of the thread pulling bar in one direction, a feed dog, a selectively positionable member, and means for controlling the extent of movement of the thread pulling bar in accordance with the position of the selectively positionable member and thereby the amount of thread removed from the bobbin spool by the bar, said means including a member actuable by the feed dog and in sliding engagement with the selectively positionable member for imparting movement to the selectively positionable member, the said means also including an angular extension on the thread pulling bar engageable by the selectively positionable member at a location dependent upon the selected position thereof.

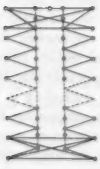
4,215,640

BUTTONHOLE STITCH METHOD

Donald J. Coughenour, Morristown, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 12, 1979, Ser. No. 75,293
Int. Cl.[3] D05B *3/06*
U.S. Cl. 112—264.1 **5 Claims**





3. A method of producing a buttonhole on a zig zag sewing machine having means for making at least one pattern of stitches, and means for generating a mirror image of said at least one pattern of stitches, said method comprising the steps of:

a. stitching along a first leg of said buttonhole extending the length thereof;

b. stitching along a second leg of said buttonhole adjacent the cutting space thereof extending the length thereof; and,

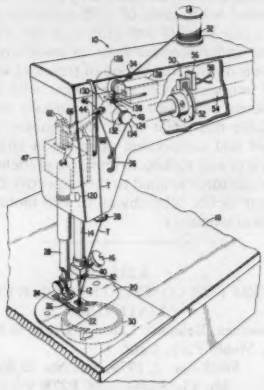
c. activating said generating means to have said sewing machine implement a mirror image of steps a and b.

4,215,641

ELECTRONIC CONTROL OF NEEDLE THREAD IN A SEWING MACHINE

Leo Dobrjanskyj, Flushing, N.Y., and Donald R. Simon, Wayne, N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 5, 1979, Ser. No. 55,135
Int. Cl.[2] D05B *49/00, 47/04*
U.S. Cl. 112—278 **9 Claims**



1. In combination with a sewing machine having a thread carrying needle adapted for endwise reciprocatory motion to penetrate a work fabric and cooperate with a looptaker in the formation of stitches, an arrangement for controlling the needle thread comprising:

means for defining a thread path from a thread supply to said needle;

a thread take-up lever positioned along said path and selectively movable in a defined range toward and away from said path, said thread take-up lever including means for slidably holding said thread;

actuator means for moving said thread take-up lever within said defined range in accordance with take-up control signals applied thereto;

thread clamping means interposed in said path between said supply and said take-up lever and responsive to clamp signals applied thereto for preventing movement of thread therethrough; and

control means for generating said take-up control signals and said clamp signals in timed relation with the operation of said sewing machine.

4,215,642

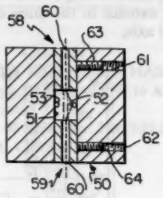
VARIABLE TWIST SELF-TWIST YARN

Phillip W. Chambley, and Alan H. Norris, both of Rome, Ga., assignors to WWG Industries Inc., Rome, Ga.

Filed Oct. 25, 1977, Ser. No. 844,616
Int. Cl.[2] D05C *17/02;* D02G *3/26*
U.S. Cl. 112—410 **6 Claims**

1. In a yarn of the type having a plurality of false-twisted

singles yarns self-twisted together to form a plied yarn with longitudinally spaced nodes of zero twist defining longitudinally distinct plied yarn segments, the improvement wherein the amount of self-twist differs from segment to segment along the plied yarn over a predetermined range of amounts of twist, said self-twist in longitudinally successive segments having



opposite twist directions, and said segments which have a same direction of twist having equal lengths and randomly different amounts of twist.

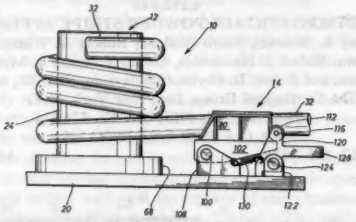
6. A plurality of yarns according to claim 1 in combination with a carpet backing, said yarns projecting through spaced points in the carpet backing to provide a plurality of mutually adjacent carpet piles.

4,215,643

QUICK RELEASE BOLLARD

Robert K. Jefferies, and Gary L. Egbert, both of Houston, Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,183
Int. Cl.[2] B63B *21/06*
U.S. Cl. 114—218 **13 Claims**



1. A bollard comprising:

a support base adapted for securement to a dock, pier, vessel deck or the like;

a bollard drum assembly including a central shaft fixedly secured to and upstanding from said support base, a drum mounted for rotation on said shaft, said drum having a relatively smooth exterior cylindrical surface for receiving a selected number of windings of a line under high tension to reduce the tension at the free length of such line to a fraction of the tension ahead of said drum;

a releasable lock assembly for selectively locking said drum against rotation relative to said shaft, said lock assembly comprising

(i) a flange forming an integral continuation of said bollard drum, said flange including peripheral detents;

(ii) a spacer ring fixedly secured to said support base in close relation to the periphery of said flange, said spacer ring having openings carrying a plurality of free lock operating members;

(iii) a movable detent ring positioned in close sliding relation to the outside surface of said spacer ring, said detent ring having detents at the inner ring surfaces thereof;

(iv) said lock operating members having a width wider than the width of said spacer ring openings so that at least a portion of the operating members must protrude into either said flange detents or said detent ring detents, whereby said bollard drum may be locked against rotation relative to said shaft by forcing said operating members into said flange detents and said bollard drum may be unlocked by moving said operating members into said detent ring detents; and

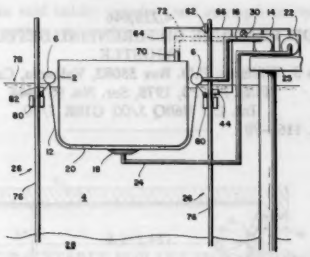
means for restraining motion of the free length of the line at such fractional tension.

4,215,644

BOAT HULL ANTI-FOULING SHROUD

Robert Jackson, 89 Woodward Island, Clearwater, Fla.

Filed Mar. 6, 1978, Ser. No. 883,414
Int. Cl.[2] B63B *59/00*
U.S. Cl. 114—222 **13 Claims**



1. A selectively floatable protective shroud for a boat hull floating in a body of water, comprising:

an inflatable, elongated toroidal bladder with an inner opening larger than the circumference of the hull of said boat at its waterline, having an inflation nozzle, located in said body of water;

a continuous, flexible, water impervious shroud having a circumference edge mounted about the circumference of said toroidal bladder and enveloping said boat hull, for protecting said hull when deployed about said boat;

a gas pump connected to said inflation nozzle of said bladder, for controllably inflating said bladder to selectively float said shroud from a submerged position beneath said boat to a deployed position enveloping the hull of said boat;

a water drain nozzle mounted on said flexible shroud for evacuating sea water from the region between said flexible shroud and said boat hull;

a water pump connected to said water nozzle controllably pumping out said sea water from said region;

a guide member mounted to the sea bed floor and connected to said bladder, for guiding said shroud from said submerged position beneath said boat into said deployed position enveloping the hull of said boat;

a gas purge valve connected to said bladder, for purging the gas inflating said bladder to move said shroud from said deployed floating position to said submerged position;

whereby said boat hull is selectively protected from exposure to said body of water.

4,215,645

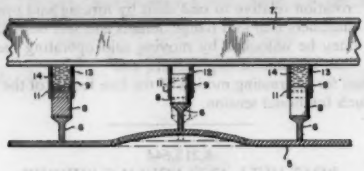
SHOCK CRUSH SUB-FOUNDATION

Kurt G. F. Moeller, R.F.D. #3, Annapolis, Md.

Filed Dec. 10, 1959, Ser. No. 858,827
Int. Cl.[3] B63G *8/40*
U.S. Cl. 114—336 **11 Claims**

1. A shock crush sub-foundation comprising a base, a frame member reinforcing said base, an equipment support member, and deformation absorbing means between said frame member and said equipment support member for absorbing plastic

deformation of said base and said base frame member to prevent deformation of said support member, said deformation absorbing means comprising a hollow member containing



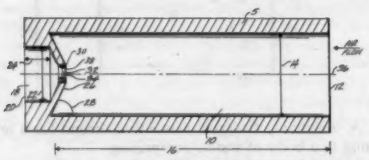
viscous fluid and having an orifice normally sealed by a diaphragm which is designed to rupture upon plastic deformation of said base member and said frame member.

4,215,646

LOW PRESSURE DIFFERENTIAL DETECTING WHISTLE

Douglas J. Williams, P.O. Box 55083, Valencia, Calif. 91355

Filed Nov. 3, 1978, Ser. No. 957,444
Int. Cl.[2] B60Q *5/00*; G10K *5/00*
U.S. Cl. 116—70 **16 Claims**



1. A low pressure differential detecting air flow whistle for producing an audible sound comprising:

inlet means for receiving air flow and for defining an acoustically resonating transmission line;

constriction means receiving air flow from the inlet means for modulating the air flow and producing thereby turbulence in the air flow passing through the constriction means; and

outlet means receiving the air flow from the constriction means for defining a loading chamber for providing impedance matching for the transmission of air wave energy from the constriction means to the environment beyond the outlet means, the modulation by the constriction means of the air flow producing an audible sound when a low pressure differential exists across the inlet and outlet means.

4,215,647

INDICATOR GAUGE WITH ILLUMINATED POINTER

Noburu Fukasawa, Kamakura, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 26, 1978, Ser. No. 909,946
Claims priority, application Japan, May 30, 1977, 52-68595[U]
Int. Cl.[2] G01D *11/28*
U.S. Cl. 116—286 **10 Claims**

1. An indicator gauge comprising:

(a) a spindle mounted for rotation about its longitudinal axis;

(b) a dial board mounted perpendicular to said spindle and having a face side and a through hole;

(c) a viewing window mounted in front of said dial board;

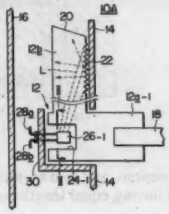
(d) an indicator pointer including:

(i) a hub portion spacedly received in said hole of said dial board to be coaxially connected at one end thereof to said spindle,

(ii) an elongated indicating portion integrally connected with said hub portion and extending radially outwardly from the outer end of said hub portion, said indicating portion mounted for movement between said face side of said dial board and said viewing window in response to rotation of said spindle about its axis, and

(iii) said hub portion and indicating portion made of a light transmitting material;

(e) said hub portion having at said other end thereof a blind hole which extends in the same direction as said spindle longitudinal axis;



(f) a cover member supported by said dial board and arranged between said viewing window and said dial board in a manner to conceal said blind hole from a view taken in the direction from said viewing window toward said dial board; and

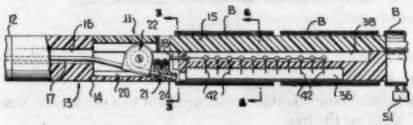
(g) a light source supported by only said cover member and having a light emitting section from which light rays are emitted, said light emitting section spacedly accommodated within said blind hole and aligned to be coaxial with said spindle.

4,215,648

ELECTROSTATIC AIR/POWDER STRIPE APPLICATOR

Stanley L. Stamets, South Holland; Robert A. Winkless, Oak Lawn; Rafael J. Hernandez, Chicago; Joseph J. Merle, Oak Lawn, and Robert D. Payne, Countryside, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,544
Int. Cl.[2] B05B *5/02*; B05C *5/02*
U.S. Cl. 118—622 **14 Claims**



1. A powder applicator comprising a discharge nozzle having an orifice for directing powder in a stream, a supply line for directing gas entrained powder towards said nozzle, de-entraining means in advance of said nozzle for de-entraining the powder and effecting the supplying of the gas and the powder in separate layers to said nozzle with the powder being concentrated in a preselected sector of said nozzle for effecting the discharging of the powder in a dense stream, and support means for determining a fixed path of axial movement for article portions to be coated, said nozzle orifice opening generally in the direction of article movement and having an axis disposed generally axially coextensive with but at a fixed angle to said axial path, and said orifice sector being disposed adjacent said path.

10. A powder applicator for applying a stripe of powder to a tubular body side seam, said powder applicator comprising support means for supporting tubular bodies for movement along a predetermined path, nozzle means for applying powder as a stripe to the interiors of tubular bodies, said support means carrying downstream of said nozzle sealing means for engaging the interior of each tubular body on opposite sides of the

portion to be coated and said support means together with said sealing means forming with each tubular body a confined area within which discharged powder may flow, said support means carrying elements formed of porous material defining side walls of said confined area, and gas supply means for directing gas through said porous material elements.

4,215,649

BABY TURTLE ISOLATION HABITAT

Donald W. Vorbeck, Napa, Calif., assignor to Atco Manufacturing Co., Inc., Napa, Calif.

Filed Aug. 4, 1978, Ser. No. 931,147

Int. Cl.[2] A01K *1/00*

U.S. Cl. 119—15 **10 Claims**

1. A live baby turtle isolation habitat comprising:

a. a plastic turtle chamber formed by an exterior enclosing wall and ceiling wall and said chamber having sufficient width and height to permit said turtle to stand in an upright position and to right itself should it become inadvertently inverted and said ceiling wall being formed with a plurality of air openings dimensioned to permit insertion of the toe nails only of said turtle therethrough;

b. a filter chamber formed in said exterior wall of said plastic turtle chamber and communicating with said air openings in said ceiling wall with the interior of said chamber;

c. a microporous filter member positioned within said filter chamber;

d. spacer means holding said filter away from said ceiling wall openings a sufficient distance so that said toe nails of said turtle cannot pierce said filter member; and

e. a sealing cap sealably connected to said filter chamber for retaining and protecting said filter element and formed with a plurality of cap openings for passage of air therethrough to said filter chamber.

4,215,650

ANIMAL FEEDING APPARATUS

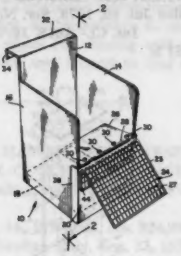
Neil E. Campbell, Hasbrouck Heights, N.J., assignor to Lab Products, Inc., Rochelle Park, N.J.

Filed May 9, 1979, Ser. No. 37,428

Int. Cl.[3] A01K *5/00*

U.S. Cl. 119—18 **8 Claims**

1. An animal feeding apparatus comprising an open top enclosure sized to contain a quantity of animal feed and having a front, a back, a pair of spaced side panels and a bottom panel, an inclined ladder member extending outwardly and downwardly from the upper edge of said front panel, and an inclined ramp member extending inwardly and downwardly into said enclosure from said upper edge of said front panel, said ramp member having a smooth and slippery upper surface located to underlie the forward body portion of an animal when the



animal climbs said ladder member and attempts to reach the animal feed within said enclosure.

4,215,651

INCUBATOR SUITABLE FOR USE IN HATCHING EGGS

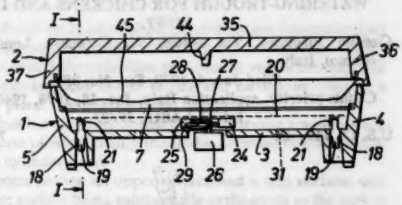
Francis H. Pearce, West Brinsea Farm, Congresbury, Avon, England

Filed Nov. 6, 1978, Ser. No. 957,854

Claims priority, application United Kingdom, Nov. 16, 1977, 47741/77

Int. Cl.[2] A01K *41/06*

U.S. Cl. 119—36 **5 Claims**



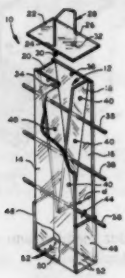
1. An incubator which comprises a housing for accomodating eggs to be hatched; a tray within the housing, for supporting eggs, the tray being reciprocable with respect to the housing and being movable freely on roller means, and the tray being provided with two downwardly directed lugs; dividers above the tray, to divide eggs on the tray into rows; a flexible screen for placing over eggs on the support means; heating means for heating air; guide means for guiding air, heated in use by the heating means, above the flexible screen whereby, in use, the screen is heated and heat is conducted downwards through the screen so as to heat upper regions of eggs; and motive means for intermittently causing relative movement between the tray and the dividers, thereby to cause intermittent rotation of any eggs on the tray, the motive means including a motor with an arm inclined to the shaft of the motor, such that actuation of the motor causes the arm, in one complete circular movement of the arm, to urge one of the two lugs and hence the tray in one direction and then to urge the other of the two lugs and hence the tray in the opposite direction, the arm carrying a roller means for rolling abutment against the lugs.

4,215,652

BIRD FEEDER

Clarence J. Kerscher, 2030 Eastbrook Dr., Toledo, Ohio 43613

Filed Jul. 10, 1978, Ser. No. 923,005
Int. Cl.[2] A01K *39/01*
U.S. Cl. 119—51 R 10 Claims



1. A feeder for handling granular materials comprising:

a feed hopper including a first spacer wall and a second spacer wall, the bottom edges of said walls being connected together and the upper edges of said walls being spaced apart, said first and second spacer walls each having at least one feed aperture formed therein for dispensing granular materials; said feed hopper including a pair of side walls maintained in a spaced apart relationship by said first and second spacer walls and at least one pair of opposed marginal edge portions thereof extending beyond the respective first and second spacer walls; and

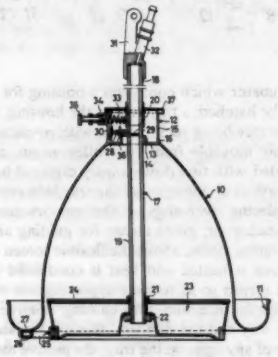
a feed receptacle positioned below said feed hopper for collecting granular material exiting through said feed apertures.

4,215,653

WATERING-TROUGH FOR CHICKENS AND LIKE FOWL

Camillo Pirovano, Via Spluga 52, Cernusco Lombardone (Como), Italy

Filed Jan. 4, 1979, Ser. No. 886
Claims priority, application Italy, Jan. 18, 1978, 19400 A/78
Int. Cl.[2] A01K *39/02*
U.S. Cl. 119—81 7 Claims



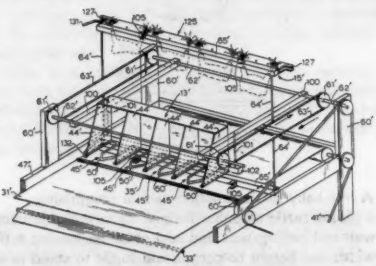
1. A watering trough for chickens and like fowl adapted to be hung or placed to rest on the ground, comprising a water tray, a valve for feeding water to the tray, a suspension stud, resilient means active between said stud and said tray so as to permit movements of the latter relative to the stud for opening said valve when the water level in the tray goes below a preselected value, and a ballast directly attached to the stud and projecting downwards relative to the bottom wall of the tray, characterized in that said ballast has integral therewith a supporting member which acts as a resting point of eccentricity and as pivot for the oscillations of said tray about a horizontal axis, in that said resilient means acting between the stud and the tray maintain the tray resting against said supporting member and tend to swing the tray in a direction about said pivot and in that said water feeding valve is composed by a nozzle integral with said stud and by a plug integral with the tray so that said plug when comes into contact with said nozzle for closing the valve limits the oscillation of the tray against the bias of said resilient means, an abutment being further comprised for limiting the oscillation of the tray under the bias of said resilient means.

4,215,654

SHACKLING SYSTEM FOR LIVE POULTRY

Alonzo E. Parker, Jr., 1031 S. Plum St., Durham, N.C. 27030

Filed Jun. 5, 1978, Ser. No. 912,726
Int. Cl.[2] A01K *37/00*
U.S. Cl. 119—97 R 6 Claims



1. A live poultry catching and shackling apparatus comprising:

(a) a powered loading apparatus having means for mechanically transporting and directing live fowl on foot from one station having the live fowl on foot to a shackling station separated therefrom and provided by said apparatus; and

(b) an elongated shackle structure operatively associated with said loading apparatus and releasably positioned at said shackling station and having laterally spaced releasable limb securing means adapted to open to receive and to thereafter close and releasably secure selected laterally spaced paired limb portions of the fowl on foot in a side-by-side array, said shackle structure including means operative in association with said loading apparatus for automatically closing said shackle structure limb securing means upon the loading thereof, and means adapting said structure when loaded to be releasably supported on a processing conveyor.

4,215,655

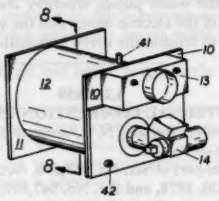
CRESCENT HEAT EXCHANGER LIQUID HEATER

Uri Limoni, 9 Huckelberry La., Oyster Bay, N.Y. 11771

Filed Oct. 2, 1978, Ser. No. 947,845
Int. Cl.[3] F22B *7/00*
U.S. Cl. 122—136 R 4 Claims

1. A liquid heating heat exchanger assembly comprising an elongated cold liquid trough element having a substantially crescent-shaped cross-section; an inner back plate having a co-acting crescent-shaped cut-out portion, hermetrically secured to the back of said trough element; and a front plate

having an opening therein having a depending crescent section, said section being sealed hermetically to the front edges of



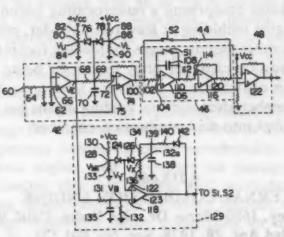
said trough element, whereby inlet cold fluid is conducted through and around said assembly while being heated.

4,215,656

ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM FOR USE WITH INTERNAL COMBUSTION ENGINE

Nobuzi Manaka, Yokosuka; Takeshi Fujishiro, Yokohama; Shigeo Aono, Seki; Akio Hosaka, Yokohama; Masaharu Asano, and Mituhiko Ezoe, both of Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 11, 1977, Ser. No. 767,988
Claims priority, application Japan, Feb. 12, 1976, 51-13251
Int. Cl.[2] F02B *3/08;* F02M *7/12*
U.S. Cl. 123—489 **10 Claims**



1. A mixture control system for controlling the air-fuel mixture ratio of an internal combustion engine for operation in an open and closed loop mode of operation comprising:

(a) an exhaust gas sensor for generating an output voltage signal representing the concentration of a predetermined constituent gas emitted from aid internal combustion engine, said exhaust gas sensor generating different output voltage signals as a function of temperature,

(b) command signal generating means for generating a command signal in response to said sensor output voltage signals, said command signal generating means operative for controlling said air-fuel mixture ratio and comprising:

(i) means for generating a control signal in response to the sensor output voltage signals, said control signal representative of sensed gas concentration,

(ii) comparator means, having a first input terminal biased at a variable reference voltage and a second input terminal responsive to said control signal, for generating a closed-loop mode enabling signal to permit said mixture control system to operate in a closed loop mode of operation when said control signal is above said variable reference voltage and a closed loop mode disabling signal to permit said mixture control system to operate in an open loop mode of operation when said control signal is below said variable reference voltage, and

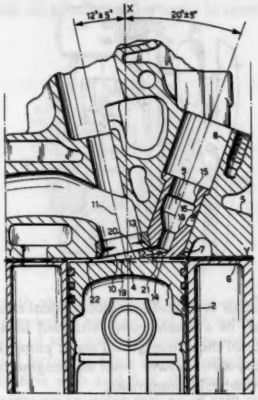
(iii) variable voltage reference setting means, responsive to said closed loop mode enabling signal, for varying said variable reference voltage from a first reference voltage corresponding to a relatively low temperature of said exhaust gas sensor to a second reference voltage corresponding to a relatively higher temperature of said exhaust gas sensor and responsive to said closed loop mode disabling signal for varying said variable reference voltage from said second to said first reference voltages.

4,215,657

COMBUSTION CHAMBER OF A DIESEL CYCLE INTERNAL COMBUSTION ENGINE

Antonio Burgio, Moncalieri, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 14, 1978, Ser. No. 924,585
Claims priority, application Italy, Sep. 23, 1977, 69101 A77
Int. Cl.[2] F02B *3/00;* F02F *1/00*
U.S. Cl. 123—269 **4 Claims**



1. In a diesel cycle internal combustion engine having at least one cylinder and a cylinder head with a precombustion chamber and in which the induction and exhaust valves are disposed in said cylinder head of the engine and have axes lying in a common plane, the improvement comprising:

a combustion chamber in said cylinder having a main part in a recess of substantially triangular cross section located in said cylinder head,

said recess having an upper surface and a side surface, said upper surface being substantially orthogonal to the axes of said induction and exhaust valves with the seats of said induction and exhaust valves being formed in said upper surface,

a duct having an opening in said side surface communicating said precombustion chamber with said main part of said combustion chamber,

a projection of triangular section standing up from the crown of the piston in said at least one cylinder, said projection being defined by:

an upper surface facing said upper surface of said recess in said cylinder head and lying at an angle with respect thereto and converging toward each other in a direction away from said duct opening in said side surface of said recess, and

a side surface,

a lateral extension of said main part of said combustion chamber being delimited by:

the bottom surface of said cylinder head of the engine, and

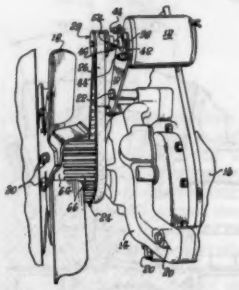
a plane part of said crown of said piston, said plane part extending orthogonal to the axis of said at least one cylinder and being situated on the side of said recess in said cylinder head remote from said precombustion chamber, said side surface of said projection standing up on said

crown of said piston being positioned whereby when said piston is in the top dead centre position this side surface lies closely adjacent said side surface of said recess in said cylinder head whereby substantially to close said main part of said combustion chamber adjacent said precombustion chamber.

4,215,658
ELECTRIC WATER PUMP

Richard J. Smith, Jr., Middleburg Heights, and Ralph R. Bellino, Cleveland, both of Ohio, assignors to W. R. Grace & Co., New York, N.Y.

Filed Jun. 9, 1977, Ser. No. 805,209
Int. Cl.[2] F01P *5/10, 5/12*
U.S. Cl. 123—41.44 **5 Claims**



1. An apparatus to retro-fit an independent electric motor to drive the shaft of a water pump attached to an automobile engine in place of the conventional water pump drive from the engine whereby more power from said engine is delivered to the road drive wheels, comprising

an electric motor having an output shaft and two parallel mounting screws extending out of one end of the motor with the screws on opposite sides diametrically thereof;

an output drive pinion means, having a circular inside opening adapted to engage said output shaft and with a securing set screw to secure the pinion to the output shaft of the motor;

a bracket means for adjustably holding said two mounting screws of the electric motor, said bracket means consisting essentially of a flat plate with a plurality of mounting holes formed on one end to permit attachment of the bracket to the water pump and engine in one of at least two different positions with respect thereto and with a clearance cut-out at another end of the flat plate to clear the electric motor shaft, an opening formed in said flat plate to one side of the cut-out to receive a first one of said electric motor screws, an arcuate slot in the flat plate to the other side of the cut-out, and said arcuate slot having a width to snugly receive the other of the electric motor screws and being so disposed as to permit a swinging motion of the electric motor on the flat plate using the first one of the electric motor screws when said first screw is mounted on said opening in said flat plate as a pivot;

attachment bolts replacing previous water pump attachment bolts to attach the bracket means to the water pump and to the engine, said attachment bolts having the same thread and diameter as said original bolts mounting the water pump to the engine and being a predetermined amount longer than said original bolts;

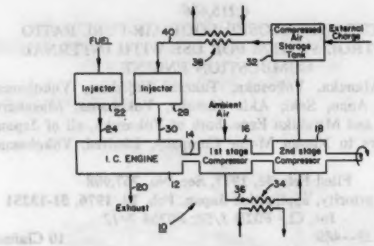
a spacer surrounding the portion of the length of each of said attachment bolts between said bracket means and said water pump, said spacers holding the bracket means in a predetermined spaced relation to the water pump to position the shaft of the electric motor mounted on the bracket means and the shaft of the water pump in alignment with each other; and

means to transmit the drive from the electric motor to the shaft of the water pump, whereby the distance between the shaft of the electric motor and the water pump may be adjusted to tension the drive transmitting means.

4,215,659
INTERNAL COMBUSTION ENGINE

Frank E. Lowther, Buffalo, N.Y., assignor to Purification Sciences Inc., Geneva, N.Y.

Continuation-in-part of Ser. No. 955,896, Oct. 30, 1978, Ser. No. 955,895, Oct. 30, 1978, and Ser. No. 947,998, Oct. 2, 1978. This application Nov. 16, 1978, Ser. No. 961,264
Int. Cl.[2] P02B *33/00*
U.S. Cl. 123—68 **63 Claims**

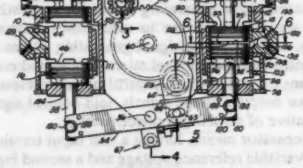


29. An apparatus comprising a reciprocating piston internal combustion engine including at least one cylinder, piston, and combustion chamber therein, means for feeding fuel into said at least one combustion chamber prior to any air being fed into said combustion chamber, and means for feeding air into said combustion chamber after said fuel feeding means has initiated the feeding of fuel into said combustion chamber.

4,215,660
INTERNAL COMBUSTION ENGINE

Donald G. Finley, 1658 Morse Dr., San Pedro, Calif. 90732

Filed Apr. 28, 1978, Ser. No. 901,171
Int. Cl.[2] F02B *75/04, 75/26*
U.S. Cl. 123—78 E **17 Claims**



1. In an internal combustion engine having a pair of cylinders, first and second pistons in each cylinder and oppositely acting in predetermined phase relationship so the the facing surfaces of the pistons are moved together and apart to define a stroke length and to at least partially define a combustion chamber, means for providing fuel to said combustion chamber, a transfer port in each cylinder, opened and closed by one of said pistons and providing air to said combustion chamber, an exhaust port in each cylinder for removing combustion products from said combustion chamber, a pivotally mounted

first rocker arm having opposite ends connected to respective first pistons for reciprocal movement of said first pistons, means connected to said second pistons for reciprocal movement thereof, and a drive shaft rotatably driven by pivotal movement of said rocker arm, the improvement comprising:

means for modifying said stroke length while said engine is operating;

means for modifying said stroke length while said engine is operating;

means for maintaining a substantially constant combustion chamber volume during combustion of said fuel along a substantial part of said stroke length; and

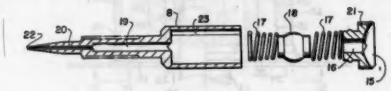
means for varying the phase relationship of said pistons while said engine is operating.

4,215,661

MIXTURE REGULATING DEVICE

Mario De Rossi, Caracas, Venezuela, assignor to Metal Elio C.A. Una compänia de acuerdo con las Leyes Venezolanas, Venezuela

Filed Aug. 28, 1978, Ser. No. 937,438
Int. Cl.² F02M 3/08
U.S. Cl. 123—587 **7 Claims**



1. In a carburetor for an internal combustion engine having a primary air passage with an air valve therein and a fuel inlet port, the improvement comprising, a needle valve member having a portion extendable into the fuel inlet port to a selected extent for bearing a flow of fuel through the fuel inlet port and into the primary air passage, means in said needle valve member defining a secondary air passage into the primary air passage, secondary air passage regulating means in said secondary air passsage for variably restricting a flow of air in said secondary air passage depending on an acceleration of the internal combustion engine, said secondary air passage comprising a large diameter chamber having said secondary air passage regulating means resiliently mounted therein, said secondary air passage regulating means comprising an air displacement body resiliently supported within said large diameter chamber in a normally open position for the passage of air through said secondary air passsage, said air displacement body being movable against its resilient support to restrict a flow of air in said secondary air passage in an oscillating manner when the internal combustion engine accelerates.

4,215,662

FUEL INJECTION APPARATUS FOR DIESEL ENGINES

Shinya Nozaki, and Shouichi Suzuki, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 22, 1977, Ser. No. 863,442
Claims priority, application Japan, Dec. 25, 1976, 51-155647
Int. Cl.² F02D 1/02
U.S. Cl. 123—447 **6 Claims**

1. A fuel injection apparatus for use in a diesel engine comprising:

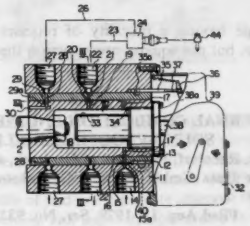
a multi-type plunger pumping means for pressurizing a fuel to be supplied from a fuel tank into cylinders of the diesel engine;

accumulator means for accumulating a quantity of pressurized fuel supplied from said multi-type plunger pumping means;

control valve means for successively distributing said pressurized fuel from said accumulator means to said cylinders of said diesel engine;

said control valve means including a fixed outer housing with a plurality of inlet ports and outlet ports positioned around the outer circumference thereof and a cylindrical bushing means rotatably and axially movable within said outer housing in response to operating conditions of the diesel engine, said bushing means including a plurality of inlet and outlet passageways which are adjustably aligned with said ports to permit said pressurized fuel to be supplied therethrough;

said control valve further including a rotatable rotor means with a plurality of through-passageways which are intermittently connected to said passageways in said bushing means to permit said pressurized fuel to be intermittently supplied therethrough, said rotatable rotor means being operatively connected to said diesel engine to rotate therewith, and including a fuel chamber for receiving said pressurized fuel from said accumulator means through a fuel inlet port in said outer housing and through-passageways in said cylindrical bushing means and said rotatable rotor means, said fuel chamber being in constant commu-



nication with said accumulator means and being successively connected to each of said fuel outlet ports during the rotation of said rotatable rotor means, said rotatable rotor means including a fuel outlet through-passageway in communication with said fuel chamber and a triangular shaped recess on an outer surface of said rotatable rotor means;

said bushing means being rotatably and axially adjustable relative to said rotatable rotor means to control injection timing and fuel quantity supplied through said control valve to said diesel engine cylinders by adjusting the exposure of said triangular shaped recess relative to one of said outlet passageway in said cylindrical bushing means; and

fuel injection nozzles, each being disposed adjacent to one of said diesel engine cylinders and being in fluid communication with said control valve means for injecting said pressurized fuel distributed by said control valve means into said cylinder of said diesel engine.

4,215,663

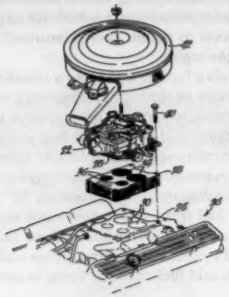
AIR-FUEL INLET DEVICE FOR INTERNAL COMBUSTION ENGINES

James K. Gaylord, 419 Sheridan Rd., Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 712,654, Aug. 9, 1976, Pat. No. 4,086,899. This application Mar. 20, 1978, Ser. No. 887,945
The portion of the term of this patent subsequent to May 16, 1978, has been disclaimed.
Int. Cl.² F02M 29/00
U.S. Cl. 123—590 **23 Claims**

1. A device for use between a carburetor and an intake manifold of an internal combustion engine to increase the efficiency and performance of the engine, the carburetor being of a type having a base and an outlet therein for communication with an associated inlet in the manifold for providing an air-fuel mixture therein, said device comprising a spacer having a passage therethrough for being positioned between the

carburetor base and the manifold with said passage alignable with the carburetor outlet and the manifold inlet, the surface of



said passage having a plurality of recesses of substantially rectangular, but not square, cross section therein.

4,215,664

INTERNAL COMBUSTION ENGINE WITH A SOUND-PROOFING SHELL

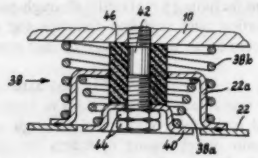
Ernst Hatz, Ruhstorf, Fed. Rep. of Germany, assignor to Motorenfabrik Hatz GmbH & Co. KG, Ruhstorf, Fed. Rep. of Germany

Filed Aug. 11, 1978, Ser. No. 932,788

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2739944

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—195 C **6 Claims**



1. An internal combustion engine, comprising:

a sound-deadening shell enclosing an engine body and detachably connected thereto at least one spring arrangement provided between said engine body and said shell, said spring arrangement having first and second axial springs and being adjustable by an adjusting means composed of a threaded bolt firmly seated in the engine body and a spring plate adjustably positioned on said bolt, said first spring bearing with one end against said spring plate and with other end against said shell, and said second spring being inserted between said engine body and said shell, whereby the axial length of said first and second springs is simultaneously and continuously variable by adjusting the relative position of said spring plate on said bolt.

4,215,665

ADJUSTABLE AIR INTAKE ASSEMBLY AND METHOD

Gary E. Stambaugh, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 15, 1978, Ser. No. 886,968

Int. Cl.² B01D *50/00*

U.S. Cl. 123—198 E **29 Claims**

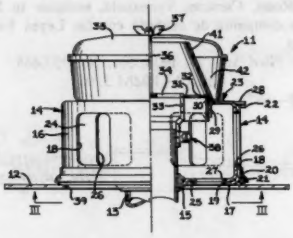
1. An air intake assembly comprising

a first housing,

first inlet means formed in said first housing for passing air therethrough,

a second housing, said first and second housings mounted for relative rotation, and

second inlet means formed in said second housing for passing air therethrough and disposed thereon for (1) alignment with said first inlet means when said first and second housings are rotated to first relative positions to permit the passage of air therethrough and (2) misalignment when said first and second housings are rotated to second relative positions to at least substantially prevent the passage of air therethrough, said first and second housings each comprising a cylindrical side wall and wherein said first inlet means comprises at least one circumferentially disposed first inlet formed through the side wall of said first



housing and said second inlet means comprises at least one circumferentially disposed first inlet formed through the side wall of said second housing.

28. A method for adjusting an air intake assembly on an engine enclosure of a vehicle for alternately communicating either ambient air or air from within said enclosure to an engine comprising the steps of

first rotating a housing of said air intake assembly to communicate ambient air directly to said engine while simultaneously blocking communication of air from within said enclosure to said engine, or

second rotating said housing to a different position for blocking communication of ambient air to said engine and for simultaneously communicating air from within said enclosure to said engine.

4,215,666

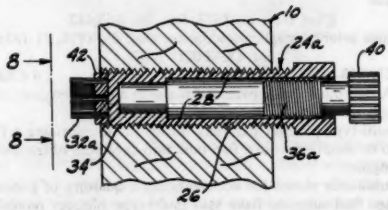
ARROW SPACING SCREW FOR ARCHERY BOW

Cornelius F. Carroll, 1310 Tuxedo Ave., Parma, Ohio 44134; Lloyd E. Abernathy, 10922 Killdare Ct., and Allen W. Miller, 10801 Ridgecrest Dr., both of St. Anns, Mo. 63074

Filed Sep. 22, 1978, Ser. No. 944,903

Int. Cl.³ F41B *5/00*

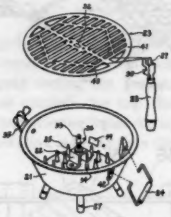
U.S. Cl. 124—41 A **3 Claims**



1. An arrow spacing screw for threaded engagement in a screw threaded bore extending through an archery bow from its' arrow side to its' opposite side for adjustably spacing an arrow from the arrow side of the bow, said arrow spacing screw being formed as a molding of pliant thermoplastic mate-

rial and comprising a cylindrical body having an external screw thread formed thereon for threaded engagement in the screw threaded bore in the bow and being of such length as to extend from both sides of the bow, a cluster of flexible filaments formed integral with said body and extending longitudinally from one end of said body for cushioning engagement with an arrow, and a turning knob formed integral with said body at its' other end.

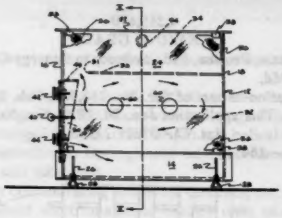
4,215,667
PORTABLE COOKING UNIT WITHOUT FUEL SUPPORTING AND VENTILATING PLATE
Cheng H. Hsu, No. 2, Lane 578, Pei-An Rd., Taipei, Taiwan
Filed May 23, 1976, Ser. No. 908,654
Int. Cl.[2] F24C *1/16*
U.S. Cl. 126—9 R **10 Claims**



1. A portable cooking unit without a fuel supporting and ventilating plate comprising: a circular oven body having a bottom and a side wall extending upwardly from said bottom; several extended piles extending upward from said oven body bottom; a bracket of inverted U-shape fixed at said oven body bottom and extending upwardly therefrom; a spindle having threads on its lower portion vertically screwed into said inverted U-shaped bracket so that said spindle moves vertically when rotated in said bracket, said spindle having a noncircular top end and a free bottom end disposed above said oven body bottom; means for preventing said spindle bottom end from being lowered below said oven body bottom; an U-shaped oven handle mounted to said side surface, at least three threaded supporting legs screwed to said oven body bottom; a grill having a central auxiliary plate, said auxiliary plate having a hole therein for receiving said spindle top end, said spindle top end being vertically supporting said auxiliary plate and grill, said grill being vertically removable from said spindle top end, said spindle top end including means for preventing rotation of said grill about said spindle so that when said grill is rotated, said spindle is rotated and said grill and said spindle are raised and lowered relative to said U-shaped bracket; a grill handle having a pair of opposing engaging hooks and teeth for moving said grill onto and off of said spindle; and a clamping clip for releasably binding said grill with said oven body.

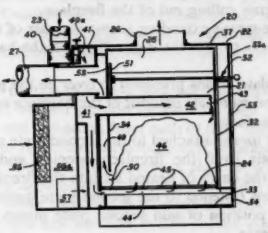
4,215,668
STOVE
Brooks H. Holcombe, 414 Catawba St., Union, S.C. 29379, and Homer E. Elwood, 27 S. Forth, Lockhart, S.C. 29364
Filed Jul. 15, 1977, Ser. No. 815,800
Int. Cl.[3] F24B *1/02*
U.S. Cl. 126—60 **9 Claims**

1. A free standing stove having excellent thermal emission and fuel combustion characteristics comprising front, back, base, top, and side plates of high-strength, heat-transmitting metal defining a main body of said stove, support means attached to said main body to position said main body in spaced relation from a supporting floor, an access opening and closure door in one side plate of said main body for introducing fuel into said main body, a horizontal baffle plate positioned in the interior of said main body between said top and base plates and defining with said plates of said main body a lower, fuel-receiving and heating compartment and an upper heating compartment, said baffle plate attached to the back plate and opposite side plate from said one side plate of said main body and having a side edge positioned in spaced relation from said one side plate to define a passageway therebetween communicating said upper and lower compartments to permit passage of combustion gases and by-products from said lower fuel-receiving compartment into said upper heating compartment, outlet means in one of said main body plates communicating with said upper compartment for removal of combustion gases and by-products of combustion from said main body, lower damper



means in said access door communicating with said lower compartment for introducing air into a lower portion of said lower compartment to provide oxygen for combustion of fuel in said lower compartment, flange means attached to and extending inwardly of said one side plate adjacent the top edge of said access opening, and upper damper means in said access door communicating with the upper portion of said lower compartment below said horizontal baffle plate and access opening flange means to provide air for circulation generally across said compartment to retard movement of combustion gases and by-products through said passageway from said lower compartment to said upper compartment.

4,215,669
HOT AIR FURNACE
Ronald C. Kerch, Bloomington, Ind., assignor to Multi-Fuel Energy Systems, Inc., Indianapolis, Ind.
Filed Jul. 24, 1978, Ser. No. 927,498
Int. Cl.[2] F24H *3/00*
U.S. Cl. 126—99 R **19 Claims**



1. A modular furnace for adaptation to a conventional domestic heating system, said modular furnace comprising:
a firebox having a front opening and two side portions;
a first grate member disposed within said firebox;
a finned heat exchange plate disposed directly atop said firebox;
means for introducing combustion air into said firebox at a first location above said first grate member and at a second location underneath the entire surface of said first grate member;
an external housing portion surrounding a majority of said firebox, said external housing portion having a heating air inlet and a heating air outlet; and

a plurality of heating air flow passageways defined by and disposed between said firebox and said external housing portion, said plurality of heating air flow passageways including two side passageways closed at their uppermost ends and a front passageway extending upwardly on opposite sides of said front opening, each of said two side passageways being in flow communication with corresponding side portions of said front passageway and said front passageway being arranged such that flow from said two side passageways into said front passageway unites to create a common air flow path across said heat exchange means prior to exiting from said heating air outlet.

4,215,670

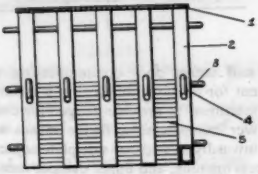
COOKING GRATE

Salvatore Reale, Preston, Md., assignor to Sunergy Corporation, Preston, Md.

Continuation-in-part of Ser. No. 764,968, Feb. 2, 1977, abandoned. This application Jun. 30, 1978, Ser. No. 921,077

Int. Cl.[2] **F23H** *13/00*

U.S. Cl. 126—164 **6 Claims**



1. A fireplace grate for conducting heat from a fire to a point outside of the fireplace comprising;

A. a plurality of structural members extending from a point interior of a fireplace to a point exterior of a fireplace;

B. means supporting the structural members above the floor of the fireplace and providing rigidity to the structural members to form a monolithic unit,

C. a plurality of fins attached between the structural members in a manner to provide an optimim transfer of heat, the fins extending perpendicularly to the structural members,

D. the fins being attached to the portion of the strucure members exterior of the fireplace,

E. a bar fastened to each of the structural members to prevent logs from rolling out of the fireplace,

F. a first plate means extending across the rear of the structural members to prevent logs rolling off the back of the grate,

G. a second plate means provided to over lie the portion of the structural members exterior of the fireplace to provide a cooking surface,

H. a deflector means attached to the second plate means for deflecting air from the fireplace opening and thereby preventing the entry of heated air into the fireplace,

I. a latch means fastened to the second plate means for adjusting the position of said second plate means and said reflector means.

4,215,671

FIREPLACE GRATE

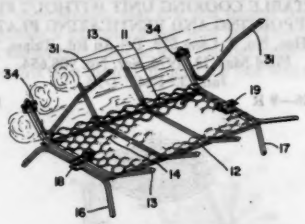
Isaac Nadolsky, Castro Valley, Calif., assignor to Bohanna & Pearce, Inc., San Leandro, Calif.

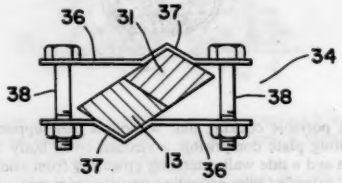
Filed Sep. 19, 1978, Ser. No. 944,492

Int. Cl.[3] **F23H** *13/00*

U.S. Cl. 126—164 **4 Claims**

1. An improved fireplace grate, comprising a pair of longitudinal members disposed in parallel, spaced apart relationship, a plurality of transverse members disposed in parallel, spaced apart fashion orthogonal to said longitudinal members and supported thereon, said transverse members each including a substantially linear medial portion and opposed distal end portions extending obliquely upwardly therefrom, said linear portions being disposed in spaced, adjacent fashion to define a frame bed, screen means supported on said frame bed for retaining coals and fuel undergoing combustion, a pair of support arms joined at their lower ends to like distal ends of any pair of said plurality of transverse members, said support arms extending obliquely upwardly above said frame bed to support a plurality of logs generally parallel to said longitudinal members in vertically stacked relationship above said frame bed, wherein said transverse members and said supports arms are formed of bar stock having at least one planar surface, first clamping means for releasably joining said support arms and said transverse members with their respective planar surfaces in confronting impingement, said first clamping means further including a pair of parallel strap members having V notches therein to receive said support arm and said transverse members, said V notches being laterally offset each from the other.





4,215,672

METHOD AND AN INSTALLATION FOR THE AIR-CONDITIONING OF GREENHOUSES AND FRAMES

Jean-Pierre J. Chiapale, Le Pontet; Jacques A. Damagnez, Villeneuve-les-Avignon; Pierre M. Denis, Grenoble, and Paul Jourdan, Meylan, all of France, assignors to Commissariat a l'Energie Atomique and Institut National de la Recherche Agronomique, both of Paris, France

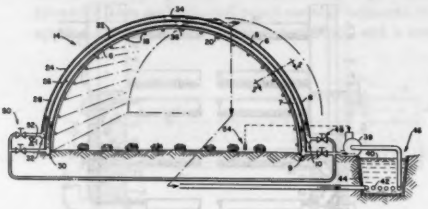
Division of Ser. No. 577,358, May 14, 1975, Pat. No. 4,108,373. This application Dec. 14, 1977, Ser. No. 860,443

Int. Cl.[3] **A01G** *9/00*; **F24J** *3/02*

U.S. Cl. 126—419 **17 Claims**

1. An installation for the plant temperature control by radiant energy in an enclosure in which plants are cultivated, wherein said installation comprises in combination on the one hand an enclosure in which at least part of said enclosure is comprised of at least two walls delimiting at least one intermediate space filled with a heat-transporting liquid, each of the walls and liquid being at least partially transparent to solar radiation, one of the walls being formed of a material which contains an additive which operates to constitute an optical filter which absorbs radiant energy having a wavelength exceeding a threshold value lying within the range of 6000 A to 7500 A and having no usefulness for that growth of plants; and on the other hand a closed circulation system for circulating

heat-transporting liquid to which heat absorbed by said one wall has been transferred, said system comprising said intermediate space or spaces, a heat-storage reservoir which is separate from said circulating system, and a pump means which includes means for determining a top threshold value of a radiative temperature which is slightly lower than the maximum



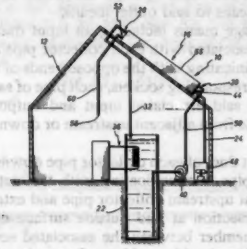
permissible limit and a bottom threshold value which is slightly higher than the permissible limit, said pump circulating the heat-transporting liquid during the daytime as long as said radiative temperature exceeds the top threshold value and circulating the heat-transporting liquid during the night as long as the radiative temperature is lower than the bottom threshold value.

4,215,673

SOLAR ENERGY COLLECTOR AND METHOD OF SOLAR ENERGY COLLECTION

Simon S. Cohen, Dr. Paizer St. No. 10/31, Haifa, Israel

Filed Oct. 2, 1978, Ser. No. 947,757
Int. Cl.² F24J 3/02
U.S. Cl. 126—419 **3 Claims**



1. A method of collecting and utilizing solar energy comprising the steps of:

positioning a solar energy collector in the path of solar radiation, the collector having separate liquid and air coolant paths, the liquid path communicating with a liquid storage tank in a closed loop and the air path communicating with a heat receiving area;

at selected times when the differential between the collector temperature and the temperature of the stored liquid is in excess of a predetermined value, forcing air through the air path to directly provide heated air to the heat receiving area and simultaneously pumping liquid through the liquid path to raise the temperature of the liquid in the tank; and

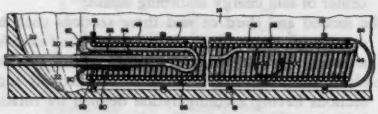
at selected times when the temperature differential is less than the predetermined value and the collector temperature is greater than the temperature within the heat receiving area, forcing air through the air path to directly provide heated air to the heat receiving area while not pumping liquid through the closed loop.

4,215,674

RADIANT ELECTROMAGNETIC ENERGY COLLECTOR

Roger E. Riggs, and Michael D. Shell, both of Reston, Va., assignors to Thermal Dynamics, Inc., Reston, Va.

Filed May 18, 1978, Ser. No. 907,207
Int. Cl.² F24J 3/02
U.S. Cl. 126—438 **15 Claims**



1. A radiant electromagnetic energy collection device, comprising:

an energy absorbing means including an evacuated tube containing a conduit for a heat exchange fluid, said conduit arranged for part of its length as a helical coil extending longitudinally through said tube and forming a cylinder in said tube; and

an energy concentrating means for directing and concentrating radiant electromagnetic energy onto said absorbing means,

said concentrating means having a reflective surface, said reflective surface having a cross-sectional configuration symmetrical about a longitudinally extending first reference plane which passes through the center of said energy absorbing means and said helical coil, said first reference plane defining a first side wall of said reflective surface on one side of said first reference plane and a second side wall of said reflective surface on the opposite side of said first reference plane;

said helical coil having a second reference plane tangent to said helical coil with said second reference plane perpendicular to said first reference plane so that said helical coil extends along said first reference plane from said second reference plane;

each of said walls having first and second portions, said second portion of each of said side walls having the shape of a portion of the involute of one half of said helical coil and extending from a point spaced from the point of tangency of said helical coil with said second reference plane to the shadow lines of said helical coil, the shadow line for each of said side walls being defined as the line which crosses said first reference plane at a point on the same side of said second reference plane as said helical coil at an angle θ and which is tangent to said helical coil on the same side of said first reference plane as its respective side wall;

said first portion of each of said side walls being an extension of said second portion of each of their respective side walls and extending from each of their respective shadow lines to respective terminal points, θ being the maximum angle from said first reference plane at which all radiant electromagnetic energy crossing said first reference plane from either direction is directed into said helical coil by either said first side wall or said second side wall, said first portion of each of said side walls being shaped so that all radiant electromagnetic energy crossing said first reference plane from either direction at said angle θ and striking any point on said respective first portions is directed along a line tangent to said helical coil, said terminal points being the points at which tangents to said side walls at said terminal points are parallel to said first reference plane.

7. A radiant electromagnetic energy collection device, comprising:

an energy absorbing means having longitudinally spaced ends;

an energy concentrating means for directing and concentrating radiant electromagnetic energy onto said absorbing

means and having three sections each having a reflective surface;

the first of said three sections longitudinally coextending with said absorbing means from end to end of said absorbing means;

said reflective surface of said first section having a cross-sectional configuration symmetrical about a longitudinally extending first reference plane which passes through the center of said energy absorbing means;

the second and third of said three sections each being a continuous extension of said first section and each forming an end portion at opposite ends of said first section;

each of said reflective surfaces of said second and third sections having a configuration defined by rotating the half of said cross-sectional configuration on either side of said first reference plane 180° about an axis lying in said first reference plane adjacent one of the ends of said energy absorbing means; and,

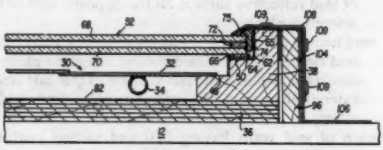
said device having a body of reinforced resin material.

4,215,675

SOLAR HEATING COLLECTOR ASSEMBLY

John M. Embree, 2606 Lawrence Rd., Charlottesville, Va. 22901

Filed Jun. 12, 1978, Ser. No. 914,896
Int. Cl.² F24J *3/02*
U.S. Cl. 126—446 **16 Claims**



1. A solar heating collector assembly for heating a heat transport fluid from solar energy impinging on the surface of an area, such as the surface of a roof, comprising:

at least one collector panel firmly attached to said surface, said collector panel having a base and a frame mounted on said base such that one pair of opposite ends of said base extends a first distance beyond the corresponding ends of said frame, said frame forming the walls of said collector panel; glazing means, mounted on said frame for providing a light transparent cover with high thermal impedance; and energy transformation means mounted in said frame for converting solar energy to heat and transferring converted heat to said heat transport fluid,

wherein said energy transformation means comprises,

a plurality of individual absorber elements, each element formed of a absorber fin and a fluid conduit in thermal contact with said fin and attached thereto, said absorber elements disposed within said frame with opposite ends of said fluid conduits extending a second distance outwardly of said frame through said corresponding opposite ends of said frame; and

input and output manifolds located exterior to said frame and respectively connecting the opposite ends of said absorber fluid conduits such that the heat transport fluid branches from said input manifold to the individual absorber fluid conduits, flows through said conduits and is recombined by said output manifold;

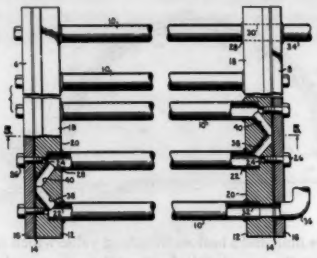
whereby all plumbing connections between said absorber fluid conduits and said input and output manifolds are made exterior to the collector panel frame.

4,215,676

FRAME ARMS FOR SOLAR COLLECTOR

George A. Gilliam, 328 Kennedy Ave., Chillicothe, Mo. 64601

Filed Oct. 11, 1978, Ser. No. 950,316
Int. Cl.² F24J *3/02*; F28D *1/00*
U.S. Cl. 126—448 **6 Claims**



6. In a solar collector apparatus having first and second frame arms with a series of side by side solar collector pipes spanning said frame arms, each of said pipes having a pair of opposed ends, and inlet means for introducing a solar collector fluid into one of said ends of the initial pipe of said series and outlet means for discharging said fluid from one of said ends of the last pipe in said series, the improvement wherein:

each of said frame arms includes a continuous body member presenting opposed, inside and outside surfaces and having a series of longitudinally spaced apart sockets therein extending inwardly from said inside surface and receiving corresponding ends of the pipes,

said body members further having internal passage means intercommunicating adjacent pairs of sockets of successive pairs of pipes in alternate arms to provide for serial flow of said fluid through said series of pipes from said inlet means to said outlet means,

said passage means including an input duct and an output duct associated with each collector pipe and respectively communicating with the opposed ends of the pipe through the corresponding sockets, each pipe of said series of pipes having said associated input and output ducts at ends opposite from adjacent upstream or downstream collector pipes,

each input duct of each collector pipe downstream from said initial pipe communicating with the output duct of the adjacent upstream collector pipe and extending to a zone of intersection at said outside surface of the respective body member between the associated sockets to present an orifice at said outside surface, whereby a number of said orifices are provided and are spaced longitudinally along said outside surfaces of said body members; and

each of said frame arms further includes an elongated cap member and means securing the latter to the body member thereof over the orifices therein to seal the same.

4,215,677

SOLAR COLLECTOR PANEL ASSEMBLY

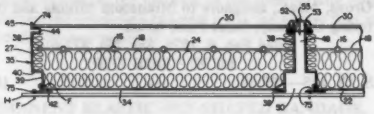
Donald P. Erickson, Denver, Colo., assignor to Rocky Mountain Sheet Metal Company, Inc., Denver, Colo.

Filed Aug. 29, 1977, Ser. No. 828,433
Int. Cl.² F24J *3/02*
U.S. Cl. 126—450 **18 Claims**

1. In a solar collector panel assembly, a prefabricated modular panel section adapted for interchangeable mounting on the flat external surface of a roof or between spaced adjacent joists on a roof comprising in combination:

an absorber plate having opposite sides and ends, an insulating layer beneath and in surrounding relation to said absorber plate, and an upper glazing layer spaced above said absorber plate, and

an outer enclosure having a bottom panel beneath said insulating layer, end wall panels along opposite ends of said panel section with the lower edges of said end wall panels adjoining opposite ends of said bottom panel, and vertical sidewall panel members along opposite sides of said panel section extending the length thereof, each sidewall panel member having a glazing layer-supporting ledge directed inwardly from said sidewall panel member adjacent to its upper end, an outwardly directed channel, and a lower



inwardly offset portion disposed beneath one of said opposite sides of said absorber plate and terminating in a lower edge adjoining a side edge of said bottom panel, each sidewall panel member including means for interchangeable mounting on the external flat surface of a roof or in a recessed roof mounting in which the spacing between said lower inwardly offset portions of each panel section is such as to permit said lower inwardly offset portions to be inserted between spaced adjacent joists along the roof.

4,215,678

ENDOSCOPE

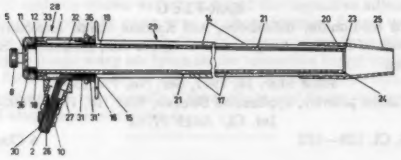
Helmut A. Heine, and Werner E. Erfurt, both of Herrsching, Fed. Rep. of Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y. and Heine Optotechnik GmbH & Co. KG, Herrsching, Fed. Rep. of Germany

Filed Feb. 28, 1977, Ser. No. 772,500

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1976, 2636510

Int. Cl.[2] A61B *1/06*

U.S. Cl. 128—6 **10 Claims**



10. A speculum for use with an endoscope head of the type having an illumination means for directing light into a tubular speculum, said speculum comprising a rigid outer tube of light conducting material having a distal end and a proximal end, said proximal end being adapted to be secured to said endoscope head and to receive light from said endoscope head, said distal end being adapted to be inserted into a body cavity, said outer tube conducting light from said proximal end to said distal end to illuminate said body cavity while permitting the passage of unwanted transverse light intermediate said proximal and distal ends, an inner tube defining viewing passageway and being dimensioned to permit observation of the interior of said body cavity therethrough, said inner tube being of a material such that it prevents extraneous light from entering said viewing passageway along the length thereof, means securing said inner tube in fixed position interior of said outer tube with the outer surface of said inner tube spaced a distance radially inwardly from the inner surface of said outer tube.

4,215,679

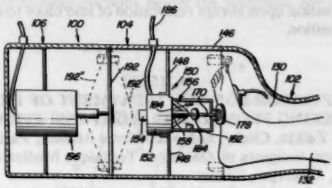
CIRCULATION ASSIST DEVICE FOR BODY EXTREMITIES

Jesse L. Rustin, Rte. 2, Dahlonega, Ga. 30533

Filed Sep. 6, 1978, Ser. No. 940,035

Int. Cl.[2] A61M *1/02*

U.S. Cl. 128—25 B **10 Claims**



1. A circulation assist device for body extremities comprising:

a casing means for enclosing the body extremity in an airtight environment;

automatic circulation assist means including a pressure producing means connected to said casing means for increasing and decreasing the pressure in said casing means, and a control means for actuating said pressure producing means, said control means including synchronization means for synchronizing the actuation of said pressure producing means to the natural circulation in said extremity; and

exercise means for allowing the exercise of said extremity while enclosed in said casing means comprising at least one piston located within the casing and positioned to be depressible by said extremity.

4,215,680

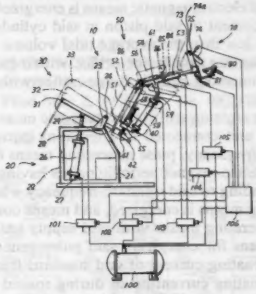
CHAIR FOR HYPNOTHERAPY

Iwao Okuda, Okayama, Japan, assignor to Og Ogiken Co., Ltd., Okayama, Japan

Filed Apr. 17, 1978, Ser. No. 897,115

Int. Cl.[2] A61H *1/00, 39/00*

U.S. Cl. 128—33 **9 Claims**



1. A chair for hypnotherapy comprising:

a base having front and back portions;

a seat mounted to said base and rotatable to frontward and backward positions relative to said base;

a back having a lower section mounted to said seat for vertical adjustment relative to said seat;

an upper section mounted to said lower section for forward and backward rotation relative to said lower section;

a head rest mounted to said upper section for vertical adjustment relative to said upper section and for forward and rearward rotation relative to said upper section; and

a control means to provide rearward rotation of said head rest relative to said upper section, rearward rotation of said upper section relative to said lower section, rearward rotation of said seat relative to said base, and abrupt forward restoration of the rearwardly rotated parts of said chair to an upright position; whereby a patient seated in said chair is subjected to tensioned positions during rearward rotation of said parts of said chair and to a relaxed position upon abrupt restoration of said chair to an upright position.

4,215,681

RESPIRATOR FOR THE TREATMENT OF PERSONS SUFFERING FROM RESPIRATORY INSUFFICIENCIES

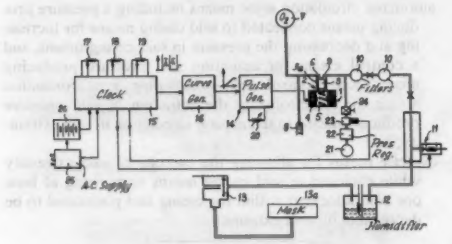
Daniel Zalkin, Clichy, and Jean-Pierre Maillot, Paris, both of France, assignors to Assistance Technique Medicale Serdahl, S.A., Maurepas, France

Continuation of Ser. No. 711,515, Aug. 4, 1976, abandoned. This application Feb. 7, 1978, Ser. No. 875,758

Claims priority, application France, Aug. 7, 1975, 75 24621

Int. Cl.[2] A61M *16/00*

U.S. Cl. 128—204.21 **8 Claims**



1. A respirator for persons suffering from respiratory insufficiencies comprising:

a respiratory mask,

a reciprocatory compressor comprising a cylinder having a gas intake orifice and a compressed gas discharge orifice, a piston slidable in said cylinder, spring means acting on said piston to slidably move it in a direction toward said discharge orifice, electromagnet means for moving said piston in a direction away from said discharge orifice when said electromagnetic means is energized, the volume of displacement of said piston in said cylinder being substantially less than the average tidal volume of a patient,

means connecting said intake orifice with a gas supply and means connecting said discharge orifice with said respiratory mask,

means for energizing said electromagnetic means comprising a supply unit connected to alternating current mains of standard frequency, pulse generating means for supplying to said electro-magnet periodic pulses having a frequency corresponding to said standard frequency when said pulse generating means is energized, and means connecting said pulse generating means with said supply unit comprising clock means for energizing said pulse generating means with alternating current of said standard frequency from said alternating current mains during spaced periods corresponding to insufflation periods and deenergizing said pulse generating means during intervening periods corresponding to expiration periods,

whereby said pulse generating means supplies pulses at said standard frequency to said electromagnetic means to produce reciprocation of said piston in said cylinder at said standard frequency to pump gas from said gas supply to said respiratory mask under pressure during said insufflation periods only, said electromagnetic means being deenergized and said piston being inoperative during intervening exhalation periods,

control means for modifying said pulses supplied by said pulse generating means to said electromagnetic means by varying the width of said pulses and thereby controlling the output of said compressor, and

valve means for venting said respiratory mask to the atmosphere to relieve said pressure during said exhalation periods.

4,215,682

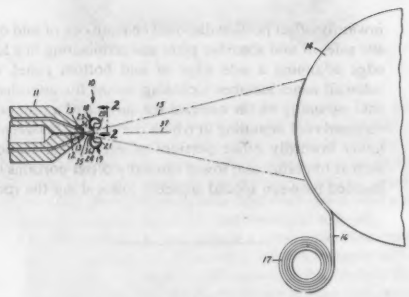
MELT-BLOWN FIBROUS ELECTRETS

Donald A. Kubik, Houlton, Wis., and Charles I. Davis, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 6, 1978, Ser. No. 875,614

Int. Cl.[2] A62B *7/10*

U.S. Cl. 128—205.29 **18 Claims**



1. A fibrous web electret comprising melt-blown fibers prepared by extruding molten fiber-forming material through orifices into a high-velocity gaseous stream where the extruded material is drawn out into fibers and solidified in the fibrous form, said fibers having electrically charged particles and a persistent electric charge that is useful to enhance filtering properties of the web, said charge having a half-life of at least one week in a room-temperature, 100-percent-relative-humidity environment.

4,215,683

EAR-PLUG

Tord R. Lundin, Billesholm, and Kalman Csiki, Landskrona, both of Sweden, assignors to Gullfiber AB, Billesholm, Sweden

Filed Mar. 16, 1977, Ser. No. 778,134

Claims priority, application Sweden, Mar. 18, 1976, 7603411

Int. Cl.[2] A61F *11/02*

U.S. Cl. 128—152 **6 Claims**

1. An ear protecting plug comprising an elastic, plug-like body of fibrous material, at least a part of said body being adapted for insertion into an auditory canal of an ear, and a casing surrounding at least said part of the body, said casing being adapted for insertion in the auditory canal, having a surface with a friction coefficient substantially lower than that of the fibrous material and being a thin plastic film wherein at least part of the plastic film includes means to permit pressure

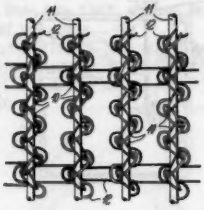
equalization at the time of introduction of the plug into a canal and to permit penetration of moisture, said means including cuts which permit the formation of passages through the plastic film, the part of the plug-like body being adapted for insertion into an auditory canal of an ear being substantially cylindrical and the plug-like body further including an expanded end part adapted to at least partially fill out the concha of the ear outside the auditory canal, the plastic film being wrapped at least around the part of the plug-like body adapted to be inserted into an auditory canal thereby producing lengthwise folds in the casing, a circumferential heat weld in the plastic film being positioned at the junction of the substantially cylindrical part and the expanded end part to fix the plastic film and weld it to the fibrous material.

4,215,684

PERMANENT ELASTIC NET-SHAPED BANDAGE, ESPECIALLY FOR MEDICAL PURPOSES

Wilhelm Westip, Wuppertal, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 943,482
Int. Cl.[2] A61L *15/01;* D04B *21/00*
U.S. Cl. 128—156 **5 Claims**



1. A permanent elastic net-shaped bandage for medical purposes, comprising a fabric with elastic threads as warps and with non-elastic threads extending transverse thereto and forming wefts, which includes in combination therewith: fringe warps independent of each other and formed by non-elastic threads, and backings of elastic synthetic threads backing said fringe warps, said fringe warps and said elastic synthetic threads being arranged substantially parallel to each other, said non-elastic weft threads and the respective adjacent wefts engaging the same area of the pertaining fringe warp while said non-elastic weft threads between skips from fringe warp to fringe warp are lying on the respective fringe warp in the form of a plurality of arcs, and said pertaining weft threads extending at a substantially right angle to said fringe warps and said elastic synthetic threads.

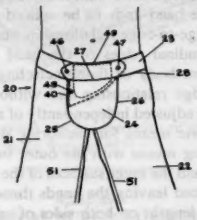
4,215,685

TROUSER CONSTRUCTION

Manfred Ibel, 178 Fifth Ave., New York, N.Y. 10010

Filed May 22, 1978, Ser. No. 908,406
Int. Cl.[2] A41D *1/06;* A61F *5/40*
U.S. Cl. 128—159 **6 Claims**

1. An anatomical trouser construction made of substantially non-stretchable material closely fitted around the pelvic region consisting of two leg portions and a combination crotch/front panel; said leg portions being suspended near the waistline and being closely fitted around each upper thigh and buttock and being joined together in the rear by a medial seam following closely the contour line of the median sagittal section of the pelvis inside the crease between the buttocks to a point near the anus; a triangular cutout being provided between said leg portions having its apex at said point near the anus exposing perineum, genitals, pubic area and the lower abdominal area above up to the waistline, said cutout being defined by two oblong edges converging at said point near the anus and a horizontal edge following the curvature of the abdominal waistline, said two oblong edges having lower curved portions where bordering perineum, genitals and pubic area and having vertical upper edge portions below the waistline in the abdominal area; said combination crotch/front panel having two converging oblong convexly curved or straight edges and a concavely curved or straight edge along the waistline, said converging oblong convexly curved or straight edges having upper vertical edge portions below the waistline, the respective oblong edges of said cutout and said combination crotch/front panel being joined together forming two off-center combined crotch/front seams, said combination crotch/front panel having a front portion and a crotch portion, said crotch portion overlying the perineum and acting like an accordion between the edges of said cutout near the perineum during leg movement, said front portion having a lower portion acting like a curved supportive panel held over genitals and pubic area.



4,215,686

PCL FABRIC/FILM LAMINATE

John B. Gregory, Weyland; Arthur D. Schwope, Newton Lower Falls, and Donald L. Wise, Belmont, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 6, 1979, Ser. No. 27,554
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—156 **3 Claims**

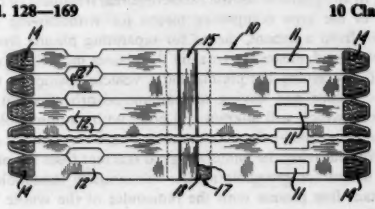
1. An article of manufacture comprising a poly(ε-caprolactone) film having affixed thereto a poly(ε-caprolactone) fabric having a non-napped side and a napped side, said non-napped side being affixed to said film.

4,215,687

BODY OR LIMB ENCIRCLING THERAPEUTIC DEVICE

Frank D. Shaw, 18 Oakwood La., Rumson, N.J. 07760

Filed May 2, 1978, Ser. No. 902,179
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—169 **10 Claims**



1. A combination for making a body or limb encircling therapeutic device comprising a plurality of body or limb encircling bands in which intermediate portions are removed to decrease the lengths of the bands and to leave pairs of edges to be spliced, one end of each band including an opening for the insertion of the other end and the said other end including a narrow length in the band to be received in the opening, said

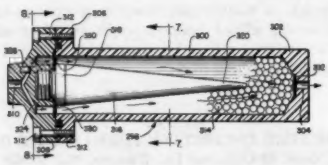
threaded band ends being capable of tightening the band around the body or limb, interlocking fabric means on the outer surface of each band and on the inner surfaces of the band ends to secure the band in its tightened condition, a flexible and unsupported band anchoring tape extending longitudinally of the body or limb intermediate the band edges to be spliced, band splicing means interfacing with the outer surfaces of the bands adjacent the edges to be spliced and with the outer surface of the intermediate band anchoring tape, the edges of the intermediate band ends to be spliced being cut to be in substantially edge-to-edge relationship and without overlap with the longitudinal edges of the band anchoring tape to maintain adjacent body or limb encircling bands in substantially edge-to-edge relationship and without overlap so that one band can be adjusted independently of adjacent bands, and interlocking fabric means for anchoring the inner surface of said band splicing means with the outer surface of said band anchoring tape and the outer surfaces of the bands adjacent the edges to be spliced leaving the bands throughout the greater portion of their lengths on both sides of said band anchoring tape separate from each other so that each band can be adjusted independently of the other.

4,215,688

APPARATUS FOR THE EXTRACORPOREAL TREATMENT OF DISEASE

David S. Terman, Houston, Tex.; Michael Sulliva, Buffalo Grove, Ill., and Herbert M. Cullis, Silver Spring, Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 9, 1979, Ser. No. 10,517
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **9 Claims**



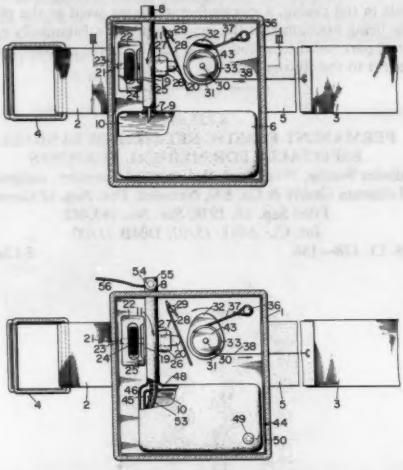
1. In an apparatus for the extracorporeal treatment of disease and of the type comprising means for withdrawing whole blood from a patient, means for separating plasma from the whole blood, means for treating the plasma including a chamber for receiving the plasma and a vehicle positioned within the chamber and having an immuno-adsorbent agent fixed thereon which will interact and bond with an immunological reactant carried by the plasma that is passed through the chamber for removing the immunological reactant from the plasma, and means for recombining the substantially immunological reactant free plasma with the remainder of the whole blood and for returning the recombined whole blood to the patient, an improved means for treating the plasma including an elongate chamber having an inlet and an outlet and a membrane within said chamber forming a vehicle having an immuno-adsorbent agent fixed thereon said membrane being coiled in a spiral with each convolution of said spiral spaced from an adjacent convolution and being positioned within said chamber so that plasma flows through the space between the convolutions of said spiral coiled membrane.

4,215,689

INJECTING APPARATUS FOR MEDICAL LIQUID

Taichiro Akiyama, and Fumiyo Mutou, both of Tokyo, Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 924,954
Claims priority, application Japan, Jul. 27, 1977, 52-89978; Dec. 12, 1977, 52-149098
Int. Cl.[2] F04B *17/04, 45/08;* A61M *5/00;* A41D *1/04*
U.S. Cl. 128—214 F **11 Claims**



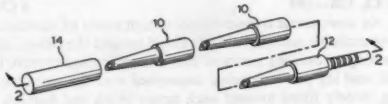
1. In an apparatus for injecting liquid into the body including means supporting the apparatus on the torso, a pump, a liquid reservoir connected to the pump, and a conduit connected to the pump and entering into the body for conveying the liquid into the body, the improvement in actuating means for said pump comprising a pump operating member, and drive means connected to said operating member for driving said operating member, said drive means including means movable in response to breathing movement, and said drive means further including indexing means moving the drive means an increment in response to each breathing movement, a plurality of increments of movement resulting in a single pumping operation whereby liquid injection occurs at a frequency less than the breathing frequency.

4,215,690

MEDICAL NEEDLE

Dimitrios G. Oreopoulos, 10 Ladywood Dr., Rexdale, Canada (M9V1K9), and Gabor Zellerman, 588-590 Richmond St. W., Toronto, Canada (M5V 1Y9)

Filed Feb. 16, 1978, Ser. No. 878,415
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—221 **6 Claims**



1. In combination at least two tubular needles each comprising:

an elongated body with a through passage;

said body having an inside wall, an outside wall, a front end and a back end;

said through passage of said body adjacent said back end of said body having a cross section greater than the cross

section of said body adjacent said front end of said body, said tubular needles being telescoped together in a series with the said front end of each needle except the last needle in the series projected into the back end of the next needle in the series;

said outside wall of said body of each needle being adapted to seat on the inside wall of said body of a needle into which it is projected adjacent the front end thereof in fluid tight relation to limit the projection of said outside wall of said body into said back end of the next needle in the series;

said outside wall of said body of each of said needles being formed with a shoulder adjacent its back end, the back end of said shoulder extending to said back end of said body and being closely spaced from the front end of the shoulder of a similar needle when said needle is telescoped together in series with other needles as aforesaid;

a removable seal over the adjacent marginal portions of said shoulder of adjacent needles in said series of needles.

4,215,691

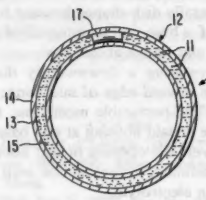
VAGINAL CONTRACEPTIVE SYSTEM MADE FROM BLOCK COPOLYMER

Patrick S. Wong, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 775,718, Mar. 9, 1977, abandoned. This application Oct. 11, 1978, Ser. No. 950,454

Int. Cl.[2] A61F *5/46*

U.S. Cl. 128—260 **7 Claims**



1. An improved vaginal contraceptive system for delivering an antifertility steroid, comprising:

(a) a body sized, shaped and adapted for easy insertion and comfortable retention in the vagina, said body comprising;

(b) a shaped wall surrounding and forming a reservoir;

(c) an antifertility steroid selected from the group consisting of progestational and estrogenic steroids in the reservoir;

(d) a liquid carrier permeable to the passage of steroid and containing an amount of steroid for prolonged release in the reservoir;

(e) the improvement comprising forming the wall of non-toxic, vaginally acceptable release rate controlling thermoplastic styrene butadiene block copolymer permeable to the passage of steroid; and,

(f) wherein the system when in operation and placed in the vagina releases at a controlled rate a contraceptively effective amount of steroid over a prolonged period of time to produce the desired antifertility effect.

4,215,692

ABSORBENT STRUCTURE

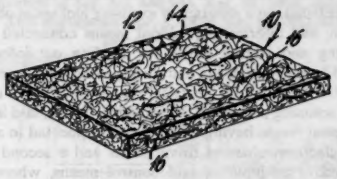
Yvon G. Levesque, Montreal, Canada, assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 879,832, Feb. 21, 1978, abandoned. This application Jan. 30, 1979, Ser. No. 7,280

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 **12 Claims**

1. An absorbent product comprising peat moss and mechanical wood pulp, said wood pulp having a Canadian Standard Freeness of from about 30–600, and present in a ratio, by weight of said mechanical wood pulp to said peat moss, of more than about 0.35;



said peat moss having a color intensity of at least 70 on the Hunter Color Scale System "C".

4,215,693

BIOLOGICAL SURGICAL DRESSING

Ulf S. E. Rothman, V. Mellauv 2, Höllriksaas; Sven C. Frederiksen, Rabäcksgatan 5, and Bernt O. Leube, Almlyckegränd 5, both of Malmö, all of Sweden

Continuation of Ser. No. 706,426, Jul. 19, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,701

Claims priority, application Switzerland, Aug. 7, 1975, 10344/75

Int. Cl.[2] A61F *13/00*

U.S. Cl. 128—296 **9 Claims**

1. A biological surgical dressing, especially a surgical dressing for wounds, comprising a combination of collagen fibers and carbamide, there being present 65 to 99 percent by weight collagen fibers and 1 to 35 percent by weight carbamide.

4,215,694

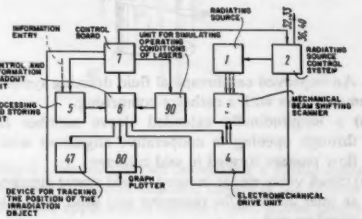
LASER THERAPY APPARATUS

Viktor L. Isakov, ulitsa Fedorova, 1, kv. 67; Yan Y. Popov, ulitsa Yakira, 16/18, korpus 2, kv. 70; Tsaly I. Vaisberg, ulitsa Engelsa, 7/10, kv. 24; Rostislav A. Kharzhevsky, prospekt 40-letia Oktyabrya, 100/2, kv. 39; Vladimir M. Pshenichny, ulitsa Parkhomenko, 60, kv. 98; Andrei I. Koba, ulitsa O. Vishni, 9, kv. 35; Boris G. Khlyvnjuk, ulitsa Moskovskaya, 5, kv. 38; Nikolai N. Solomko, ulitsa Zhadanovskogo, 4, kv. 6, all of Kiev, U.S.S.R.; Ivan V. Kudryavtsev, deceased, late of Kiev, U.S.S.R., and by Galina A. Kudryavtseva, administrator, ulitsa Suvorova, 13, kv. 108, Kiev, U.S.S.R.

Continuation of Ser. No. 686,482, May 14, 1976, abandoned. This application Jun. 1, 1978, Ser. No. 911,673

Int. Cl.[2] A61N *5/01*

U.S. Cl. 128—303.1 **8 Claims**


INFORMATION ENTRY
CONTROL BOARD
UNIT FOR SIMULATING OPERATING CONDITIONS OF LASERS
RADIATING SOURCE
RADIATING SOURCE CONTROL SYSTEM
CONTROL AND INFORMATION READOUT UNIT
PROCESSING AND STORING UNIT
MECHANICAL BEAM SHIFTING SCANNER
GRAPH PLOTTER
DEVICE FOR TRACKING THE POSITION OF THE IRRADIATION OBJECT
ELECTROMECHANICAL DRIVE UNIT

1. A therapy apparatus comprising a radiating source adapted to generate directional radiation; control means connected to said radiating sources for controlling the radiation parameters of said radiating source; scanner means including electromechanical drive means coupled to said radiating source for focusing a beam of directional radiation such as a laser beam generated by said radiating source on an object to be irradiated and oriented in three spatial coordinates; process-

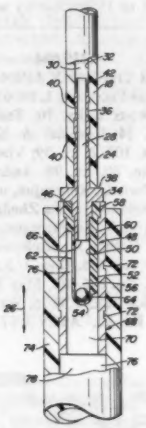
ing and storing means for receiving, processing and storing information, which contains preselected instructions concerning the desired dosing and directions and extent of movements of said radiating source relative to the boundaries of the object to be irradiated, on a program of exposing biological objects to radiation; and information readout means connected to said processing and storing means for reading out information received by said processing and storing means and for converting the information into electrical signals suitable for controlling the scanning process of the radiating source, said information readout means having a first output connected to an input of said electromechanical drive means and a second output connected to an input of said control means, whereby the orientation and the radiation parameters of the radiation beam generated by said radiating source can be automatically controlled by preselected and programmed instructions.

4,215,695

FLUID DRAINING SYSTEM

Eugene B. Spitz; Richard E. Brenz, both of Media, and Charles C. Hansford, Phoenixville, all of Pa., assignors to Medical Devices, Inc., Media, Pa.

Filed Feb. 22, 1978, Ser. No. 880,103
Int. Cl.[2] A61M *1/00, 27/00*
U.S. Cl. 128—350 V **14 Claims**



1. An improved cerebrospinal fluid draining system in fluid communication with a catheter comprising:

(a) a longitudinally extended sleeve member having a through opening in cooperative alignment with a fluid flow passage formed in said catheter;

(b) check valve means secured to said sleeve member having an inlet opening for receiving said fluid from said sleeve member; and,

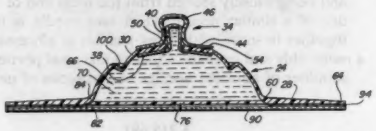
(c) hinge means formed on said check valve means for providing a support fulcrum line to stabilize said check valve means responsive to pressure changes therein in order to aid in (1) opening an outlet passage formed through said check valve means responsive to a predetermined fluid pressure value within said valve means, and (2) closing said outlet passage when said fluid pressure is less than said predetermined value, said hinge means being secured to an external surface of said check valve means.

4,215,696

BIOMEDICAL ELECTRODE WITH PRESSURIZED SKIN CONTACT

Roger E. Bremer, Fort Lee, N.J., and Richard D. Falb, Bristol, Ind., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Filed Mar. 20, 1978, Ser. No. 890,630
Int. Cl.[3] A61B *5/04*
U.S. Cl. 128—641 **12 Claims**



1. A single use disposable biomedical electrode for use on a subject for receiving body-generated electrical signals at a body surface of the subject,

said electrode comprising:

an inverted, generally dish-shaped housing having a vaulted dome-like roof, a base, and an integrally-formed, laterally extending annular flange at said base,

said housing presenting a downwardly directed opening bounded by an inward edge of said flange,

a microporous, fluid-permeable membrane, means securing said membrane to said housing at said base, whereby said membrane covers the opening in said housing,

said membrane defining, in conjunction with said housing, a chamber for an electrolyte,

tissue-compatible electrolyte means substantially filling said chamber,

a peelable, fluid-impervious, protective cover film overlying said membrane and said flange,

pressure-sensitive adhesive means releasably securing said film to said flange,

electrically-conductive terminal means sealed to and extending through said roof of said housing and providing electrically-conductive communication between the exterior of said housing of said electrode and said electrolyte means contained within said chamber,

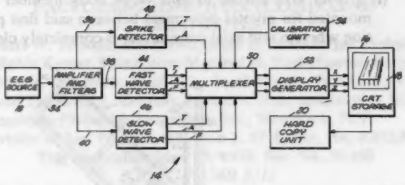
said protective film being selectively removable to expose said adhesive means to facilitate securement of said electrode to a body surface through said adhesive means, and

a ring-like transformation zone circumscribing said housing at a height intermediate upper and lower limits thereof, said zone extending in a plane generally paralleling said fluid-permeable membrane and functioning as a mechanical discontinuity and weakened portion of the wall of said housing, said vaulted roof of said housing being displaceable downwardly in response to pressure applied thereto to deform said housing at said transformation zone, thereby reducing the volume of said chamber containing said electrolyte means, resiliently pressurizing said electrolyte means contained in said chamber, and stressingly urging said electrolyte means to pass through said porous membrane and establishing positive electrically conductive contact with a body surface therebeneath, thereby completing and maintaining a sustained and stable conductive path between the body of the subject and said terminal means of said electrode.

4,215,697
APERIODIC ANALYSIS SYSTEM, AS FOR THE ELECTROENCEPHALOGRAM

Mihai C. Demetrescu, Irvine, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Dec. 26, 1978, Ser. No. 973,423
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—731 13 Claims



1. A system for analyzing an interval of an aperiodic waveform, manifest as an electrical signal, comprising:

means for detecting predetermined individual waves in said electrical signal to provide individual wave signals representative of the time of occurrence, the period and the amplitude of a detected wave;

a storage means for containing a three-dimensional static image; and

means connected to receive said individual wave signals for scaling said wave signals into said three-dimensional image to depict waves as linear symbols positioned in one dimension with reference to period and in another dimension with reference to time of occurrence and scaled in the third dimension with perspective adjustment to indicate amplitude.

4,215,698
DENTAL-CARIES DETECTOR

Elie S. Nuwayser, Wellesley, Mass., assignor to Abcor, Inc., Wilmington, Mass.

Filed Jun. 8, 1978, Ser. No. 913,545
Int. Cl.[2] A61B 5/05
U.S. Cl. 128—734 22 Claims

1. A dental-caries detector for the determination of tooth condition in a tooth by measurement of electrical properties of the tooth, which dental-caries detector comprises:

(a) an electrically conductive probe having a probe tip, the probe tip adapted to be placed on a wet, electrically conductive, measurement site on a tooth surface;

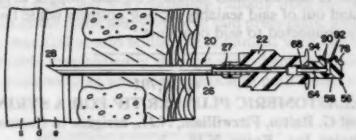
(b) a drying means to provide for a surrounding curtain of dry fluid to be applied about the probe tip and to provide in use a dry, electrically, nonconductive area on the surface of the tooth about the wet test-measurement site to which the probe tip is applied; and

(c) shield means surrounding the probe tip and adapted in use, when the probe tip is applied to the wet measurement site, to seal peripherally the probe tip by the contact of the shield means against the tooth surface and from the nonconductive dry area about the measurement site, thereby permitting the probe tip to measure in a stable reproducible manner the electrical condition of the tooth.

4,215,699
POSITION INDICATING DEVICE

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 680,955, Apr. 28, 1976, abandoned.
This application Apr. 3, 1978, Ser. No. 892,562
Int. Cl.[3] A61B 5/00
U.S. Cl. 128—748 6 Claims



1. A device for indicating the position of the tip of a needle in the epidural space within a patient's body where the body pressure is slightly negative, comprising:

a hollow needle having a tip with an opening at a distal end of the needle for placement within said patient's body, a lumen communicating with the tip opening, and a hub at a proximal end of the needle;

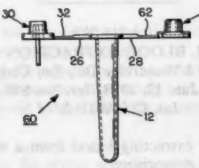
a body member having a cavity at an outer surface of the body member, raised indicating means in said cavity, a passageway communicating with the cavity, and a tubular section at a distal end of the body member defining an end portion of the passageway, said tubular section being received in the needle hub with the passageway communicating with the needle lumen and the tip opening; and

a flexible film mounted on said body member normally spaced outwardly from and extending across said indicating means and forming an outer wall of said cavity, said film flexing inwardly into contact with said indicating means when the needle tip opening communicates with said slight negative pressure in said epidural space within said patient's body.

4,215,700
BLOOD COLLECTION DEVICE

Ronald Crouther, Manchester; Vincent H. Li, Maryland Heights, both of Mo., and Larry H. Dodge, LaHabra, Calif., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Aug. 25, 1978, Ser. No. 937,013
Int. Cl.[3] A61B 5/14, 10/00
U.S. Cl. 128—763 5 Claims



1. A blood collection device comprising a plastic container having a blood collection chamber closed at the bottom end and open at the upper end, a capillary tube holder removably connectable to the upper open end of the container, capillary tube means connected to said holder with one end in fluid communication with said chamber and the opposite end externally of said chamber and adapted to be disposed in contact with a source of blood for conveying blood from the source to said chamber when in use, a pair of circumferentially spaced, generally radially outwardly extending plastic extension members integrally connected to the upper portion of said container with the radially outer ends thereof at different circumferential locations about said container and with said outer ends spaced

apart a distance at least twice that of the diameter of the upper end of said container for supporting said container when inserted into a container receiving opening of a centrifuge which has a diameter greater than the maximum outer diameter of said container each of said extension members having a circumferential width less than its radial length and less than the diameter of the upper end of said container stopper movable into and out of a position sealably closing the upper end of said container, and flexible strap means integrally connecting said stopper to said container for allowing said stopper to be moved into and out of said sealably closing position while being integrally connected to said container.

4,215,701

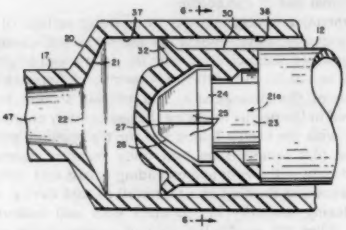
ELASTOMERIC PLUNGER TIP FOR A SYRINGE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Continuation-in-part of Ser. No. 870,118, Jan. 17, 1978, which is a continuation-in-part of Ser. No. 714,644, Aug. 16, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,304

Int. Cl.[2] A61B 5/00

U.S. Cl. 128—763 **44 Claims**



1. An elastomeric plunger tip particularly suited for a blood sampling syringe, said tip comprising a compressible, elastomeric material having a durometer of about 35 to about 75 when measured on the Shore A scale, having the ability to retain its resilience at temperatures at least as low as 0° C., and being provided with a peripheral annular wiper lip extending axially forwardly and radially outwardly so that it forms the sole sealing element when said plunger tip if inserted in said syringe, said plunger tip providing the syringe with a self-aspirating characteristic when used to sample arterial blood while maintaining an effective seal for containing the blood sample.

4,215,702

ARTERIAL BLOOD EXTRACTION DEVICE

Patrick Ayer, Rte. 3 Woodridge Dr., Eau Claire, Wis. 54701

Filed Jan. 12, 1978, Ser. No. 868,971

Int. Cl.[2] A61B 5/14

U.S. Cl. 128—766 **11 Claims**

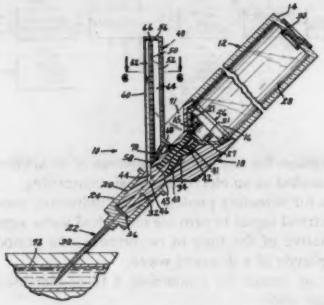
1. A device for extracting blood from a vessel utilizing a cannula or needle, comprising:

(a) a container member under vacuum having a closed and an open end;

(b) a valve body member having a first end affixed to said open end of said container member and a second end sized to receive the cannula, said valve body member having a first axial passageway therethrough providing fluid communication between the cannula and said container member, and a recess intersecting said first axial passageway and aligned generally transverse with respect to the axis of said first axial passageway; and

(c) valve means affixed to said valve body member for regulating the flow of blood through said axial passageway, said valve means including a tubular member having first and second ends and a continuous flexible side wall therebetween defining a second axial passageway, said second axial passageway defining a portion of said first axial passageway through said valve body member and means for selectively pinching said flexible side wall upon itself transverse to said second axial passageway, said pinching means normally biased to a first position wherein said flexible side wall is pinched upon itself completely closing said second axial passageway, said pinching means comprising:

(i) a lever arm affixed to said valve body member and mounted for pivotal movement between said first position wherein said axial passageway is completely closed



and a second position wherein said axial passageway is fully open;

(ii) a pinching member affixed to said lever arm and mounted for reciprocal movement within said recess, said pinching member having an aperture therein in which is received said tubular member, said pinching member in said first position collapsing said side wall of said tubular member upon itself, said pinching member in said second position permitting said tubular member to regain its tubular shape so that said axial passageway is fully open.

4,215,703

VARIABLE STIFFNESS GUIDE WIRE

James K. V. Willson, P.O. Box 2144, Mobile, Ala. 36601

Continuation-in-part of Ser. No. 797,551, May 16, 1977, abandoned. This application Aug. 29, 1978, Ser. No. 937,775

Int. Cl.[2] A61M 25/00

U.S. Cl. 128—772 **16 Claims**

1. A variable stiffness vascular guide wire for use with a flexible catheter, comprising an elongated flexible closely helically wound wire coil, an elongated stiffness control means comprising a series of core wires connected at one end to the wire coil adjacent the distal end of the guide wire and extending through substantially the entire length of the interior of the wire coil to the proximal end of the guide wire, and actuator handle means secured at said proximal end to one end of the wire coil and to the other end of the wires of the stiffness control means, said guide wire having unrestricted flexibility in bending when the wires of said stiffness control means are axially unstressed and having increasing inflexibility in bending as axial tension in said wires is increased within the confines of said wire coil, said actuator handle means including means for

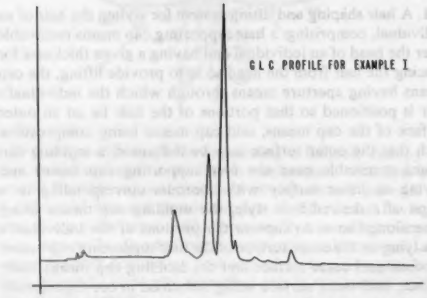
adjusting the relative axial displacement of the one end of the wire coil with respect to the other end of the wires of the stiffness control means to vary the tensional force in said stiffness control means.

4,215,704

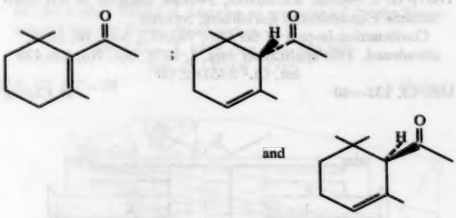
USE IN SMOKING TOBACCO COMPOSITIONS AND SMOKING TOBACCO ARTICLES OF 1-ACYL-2,6,6-TRIMETHYLCYCLOHEXENE DERIVATIVES

Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; Robin Kasper, Eatontown; Manfred H. Vock, Locust; Joaquin Vinals, Red Bank, all of N.J.; Jacob Kiwala, Brooklyn, N.Y., and Frederick L. Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 965,418, Dec. 1, 1978, Pat. No. 4,173,850.
This application May 15, 1979, Ser. No. 39,158
Int. Cl.[2] A24B *3/12*
U.S. Cl. 131—17 R **2 Claims**



1. A process for augmenting or enhancing the aroma or taste of a smoking tobacco comprising the step of adding to smoking tobacco a composition consisting essentially of an organoleptic modifying quantity of at least one 1-acetyl-2,2,6-trimethylcyclohexene having a structure selected from the group consisting of:



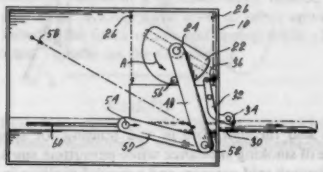
4,215,705

CIGARETTE MAKING MACHINE

Raymond Marcil, 2345 Lacordaire, Montreal, Quebec, Canada (H1N 2L7)

Filed Nov. 29, 1978, Ser. No. 964,809
Int. Cl.[2] A24C *5/42*
U.S. Cl. 131—70 **3 Claims**

1. A manually-operated cigarette making machine comprising a housing having a top wall and side walls, an elongated tobacco housing located in said housing and having an access opening in the top wall of said housing, a nipple secured to a side wall of said housing and protruding therefrom and in communication with said chamber, being in alignment with one longitudinal edge thereof, a press-plate movable in, and transversely, of said chamber between a retracted position and an operative position close to said longitudinal edge of said chamber, whereby tobacco placed in said chamber through said access opening, is compressed into a substantially cylindrical body against said longitudinal edge of said chamber, spring means biasing said press-plate into said retracted position, an upright shaft journalled in the top wall of said housing and extending therethrough, a cam plate located in said housing, secured to said shaft and having an outer cam edge directly engaging said press plate, an actuating lever entirely disposed above said top wall of said housing and secured to the upper end of said shaft, and not protruding radially from any of said side walls in the retracted position of said press-plate, a plunger slidably mounted in said housing in alignment with said nipple and movable longitudinally through said chamber from a retracted position to an advanced position to push tobacco compressed in said chamber by the press-plate out of the said nipple into a receiving paper cigarette tube held on said nipple, first and second arms pivotally interconnected at one end and having their opposite end pivotally connected to said shaft and to said plunger, respectively, an abutment means rigidly secured to said cam plate, radially spaced from said shaft and engageable with said first arm, initial rotation of said cam plate by said actuating lever first moving said press-plate from said retracted position to said operative position and further rotation of said cam plate causing said abutment means to engage said first arm and rotate the same about said shaft to thereby cause said plunger to move from its retracted position to its advanced position, first spring means biasing said press-plate into its retracted position and second spring means biasing said plunger into its retracted position.



4,215,706

NICOTINE TRANSFER PROCESS

Thomas M. Larson, McLeansville; Thomas B. Moring, Jamestown, and M. Sue Ireland, Greensboro, all of N.C., assignors to Loew's Theatres, Inc., New York, N.Y.

Filed Oct. 13, 1978, Ser. No. 951,071
Int. Cl.[2] A24B *15/02*
U.S. Cl. 131—143 **14 Claims**

1. A process for transferring nicotine from a donor tobacco to a substrate comprising the steps:

(a) contacting the substrate with a solution of a strong acid or an ammonium salt of a strong acid in order to impregnate or deposit on the substrate an amount of said acid or salt;

(b) drying the substrate; and

(c) contacting the donor tobacco with the substrate under effective conditions for a length of time sufficient to effect a transfer of nicotine from the donor tobacco to the substrate.

4,215,707

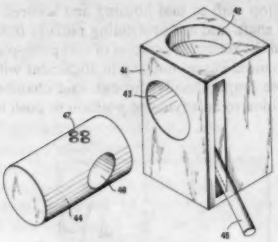
WATER PIPE

Joshua D. Elrich, 2302 Coleridge Dr., Silver Spring, Md. 20910

Filed Aug. 17, 1978, Ser. No. 934,621
Int. Cl.[2] A24F *1/30, 3/02*
U.S. Cl. 131—173 **8 Claims**

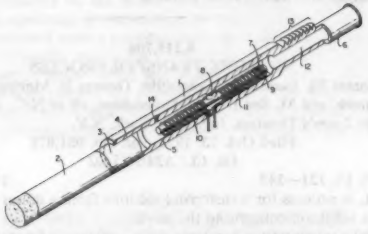
1. A bowl arranged to be associated with a smoking device and presenting a cavity for holding a charge of smoking substance comprising: a housing provided with a through bore defining a smoke passage and one end of said bore defining the

lateral walls of the cavity; and a movable member located in said housing and extending across said bore and defining the base of said cavity, said member presenting a large diameter through bore and including means defining a support surface provided with at least one passage smaller in cross section than said through bore in said member, said member being movable between a first position in which said support surface extends



across said through bore in said housing for supporting the charge of smoking substance while permitting smoke and air to pass through said passage, and a second position in which said through bore in said member is aligned with said through bore in said housing to present a passage for the fall of ashes and debris from the cavity and through said bores, and out of said housing.

4,215,708
CIGARETTEPIPE WITH PURIFIER
Evert J. S. Bron, Scholeksterlaan 54, Sneek, Netherlands
Filed Feb. 23, 1978, Ser. No. 880,720
Claims priority, application Netherlands, Mar. 2, 1977, 7702210
Int. Cl.[2] A24F *13/04*
U.S. Cl. 131—262 B **15 Claims**



1. A pipe for use in connection with the smoking of cigarettes, cigars and other tobacco articles, said pipe having:

a receiving hollow at one end to receive the article to be smoked;

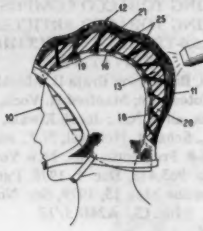
a mouthpiece;

a smoke channel communicating said mouthpiece with said receiving hollow; and

an apparatus fixed in said smoke channel to purify the smoke; said apparatus for purifying the smoke comprising catalytic afterburner means operable to catalytically oxidize incompletely burned hydrocarbons and carbon monoxide and to reduce, substantially, the percentage of nicotine and tar in the smoke passing through said catalytic afterburner means;

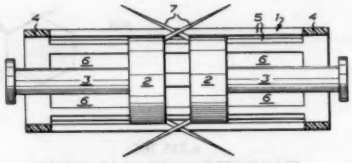
said catalytic afterburner means comprising a spiral-shaped catalyst extended in the direction of flow of smoke and disposed in said smoke channel in the path of smoke passing therethrough, to force the smoke to flow in contact with said spiral shaped catalyst along an extended path.

4,215,709
HAIR SHAPING AND LIFTING SYSTEM
Uriah H. Carr, 8852 S. Michigan Ave., Chicago, Ill. 60619
Filed Oct. 11, 1978, Ser. No. 950,270
Int. Cl.[2] A45D *1/00*
U.S. Cl. 132—9 **13 Claims**



1. A hair shaping and lifting system for styling the hair of an individual, comprising: a hair supporting cap means receivable over the head of an individual and having a given thickness for spacing the hair from the head so as to provide lifting, the cap means having aperture means through which the individual's hair is positioned so that portions of the hair lie on an outer surface of the cap means, said cap means being compressible such that the outer surface may be deformed; a molding cap means receivable over the hair supporting cap means and having an inner surface with contours corresponding to a shape of a desired hair style, the molding cap means being dimensioned so as to capture the portions of the individual's hair lying on the outer surface of the hair supporting cap means between said outer surface and the molding cap means inner surface, said outer surface being deformed in correspondence with the inner surface contours of the molding cap means causing corresponding compressed areas of the hair supporting cap means.

4,215,710
CURLER
Harry G. I. Sundin, Karlshamn, Sweden, assignor to AB Karlshamns Plastindustri, Karlshamn, Sweden
Continuation-in-part of Ser. No. 742,282, Nov. 16, 1976, abandoned. This application Aug. 2, 1978, Ser. No. 930,428
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—40 **11 Claims**



1. A curler comprising a tubular spool having a plurality of angularly spaced apart, longitudinally extending guide slots formed therein, a pair of piston members slidably mounted in the opposite hollow ends of said spool, a plurality of prongs on each of said piston members in positional correspondence with said respective guide slots and adapted to extend therethrough in substantially conical array at an acute angle to the longitudinal axis of the spool and with the prongs of said respective arrays in opposed relation, and manually operable means enabling axial in and out movement of said piston members in said spool, said prongs and guide slots being so arranged that said piston members can be moved outwardly to a position in

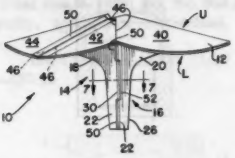
which the conical arrays of their prongs do not overlap, and inwardly to a central position where the arrays of prongs extend from their respective guide slots and overlap substantially along a circle concentric with the longitudinal axis of the spool and extend upwardly and outwardly in opposite respective directions from the spool for substantially their full lengths.

4,215,711

DISPOSABLE UMBRELLA OF PAPERBOARD MATERIAL OR THE LIKE

Terry Hermanson, c/o Mr. Christmas Inc., 41 Madison Ave., New York, N.Y. 10010

Filed Dec. 28, 1978, Ser. No. 973,841
Int. Cl.[2] A45B *13/00, 19/00*
U.S. Cl. 135—19.5 **10 Claims**



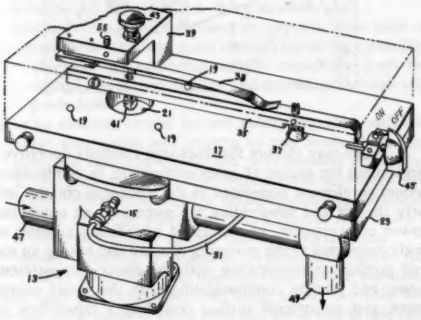
1. A disposable umbrella comprising a foldable canopy of paperboard material or the like in combination with first and second foldable support members of paperboard material or the like, said first and second support members each having a pair of wing-like struts with downwardly extending tail portions, upwardly directed edges supporting said canopy, and means foldably connecting said pair of struts, said means having a generally vertically extending axis in the opened condition of said umbrella.

4,215,712

READY PRESSURE ATTACHMENT FOR EXISTING ANTI-G VALVES

Robert M. Shaffstall, San Antonio; Russell R. Burton, Stockdale, and Jamy L. Jaggars, San Antonio, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 5, 1978, Ser. No. 966,680
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 **4 Claims**



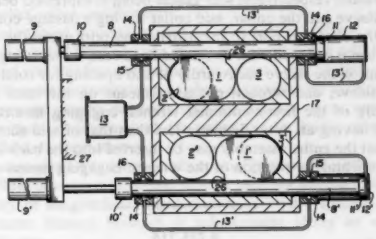
1. A ready pressure attachment for use on an anti G garment having a G valve with a "press-to-test" button on the upper portion thereof, said attachment comprising a base plate of substantially rectangular configuration attached to the upper portion of the G valve, said base plate having an access opening over the "press-to-test" button on the G valve, a cover plate fixedly attached to the outer portion of the lower surface of said base plate, complementary circular openings in the lower surface of said base plate and the upper surface of said cover plate, a diaphragm assembly positioned in said circular openings for vertical movement in response to changes in pressure in the anti G garment, a pivotably mounted lever on the upper surface of said base plate, the outer end of said lever being positioned directly over said diaphragm assembly for vertical movement in response to corresponding vertical movement of the diaphragm assembly, a leaf spring mounted over said lever for applying a downward force thereon, and a knob mounted near the inner end of said lever over the access opening in said base plate whereby the downward force on said lever causes said knob to activate the "press-to-test" button on the G valve and allow to flow into the anti G garment until the pressure is raised to a predetermined desired level causing the diaphragm assembly and lever to move upward to oppose and balance the force of the leaf spring while closing the "press-to-test" button on the G valve.

4,215,713

CONTROL VALVE FOR VISCOUS MATERIALS

Herbert Kuhlmann, Wibaustr. 1, 6466 Gründou-Rothenbergen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,560
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1977, 2700800
Int. Cl.[2] F04B *15/02*; F16K *15/40*
U.S. Cl. 137—238 **4 Claims**

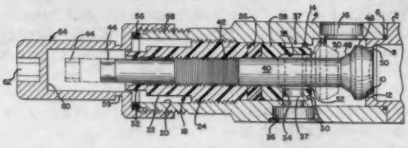


1. A control valve for viscous materials comprising valve housing means, suction inlet port means in said valve housing means connectable to respective pump means, pressure outlet port means in said valve housing means connectable to conveying conduit means for said viscous materials, valve plate means arranged for sliding movement in said valve housing means to open and close said inlet port means and said outlet port means, drive rod means operatively connected to said valve plate means, guide bearing support means operatively supporting said drive rod means at opposite ends of said valve housing means for sliding back and forth movement of said drive rod means, drive means (**9, 9'**) operatively connected to one end of said drive rod means (**8, 8'**) for reciprocating said drive rod means, piston means (**11, 11'**) at the opposite end of said drive rod means, cylinder means (**12, 12'**) arranged so that said piston means (**11, 11'**) are movable in said cylinder means, and rinsing liquid supply means (**13, 13'**) operatively connected to said cylinder means (**12**) so that said piston means (**11, 11'**) on its pressure stroke moves against the rinsing liquid in said cylinder means, said bearing support means (**14**) comprise chamber means (**15**) surrounding said drive rod means, said rinsing liquid supply means comprising a rinsing liquid container (**13**) and rinsing liquid conduit means (**13'**) operatively interconnecting said rinsing liquid container (**13**) and said cylinder means (**12, 12'**) through said chamber means (**15**) in said bearing support means (**14**), whereby said drive rod means are directly cleaned in said chamber means of said bearing support means.

4,215,714
VALVE AND METHOD OF MAKING

Charles E. Lane, 1041 Pawnee Rd., Wilmette, Ill. 60091

Filed Jun. 1, 1978, Ser. No. 911,429
Int. Cl.[3] F16K *27/12, 41/18*
U.S. Cl. 137—269 **8 Claims**



1. In a refrigeration valve comprising a body having a front port, a back port, a distribution port therebetween, a charging port connected to the back port, and an opening from the back end of the body extending to the back port, a valve stem and seat assembly comprising a sleeve threaded into said opening, a sealing gasket slideably fitted in said opening in gas-tight engagement therewith, a collar in said opening having its front end seated against an internal shoulder on said body at the front of said back port, said assembly also comprising a valve stem in threaded engagement with the interior of said sleeve and having an unthreaded portion slideably fitted in the gasket in gas-tight engagement with its inner diameter, said stem portion extending through the collar and having a head with oppositely facing seats engageable alternatively with mutually facing seats around said front port and around the front end of the collar, respectively, said gasket being compressed between the sleeve and the collar, said collar having a passage connecting the charging port to the distribution port when the collar seat is not engaged with its related head seat, wrench engaging means on the sleeve backwardly of said opening for rotation of the sleeve, and wrench engaging means on the stem backwardly of the first-mentioned wrench engaging means, said head having an outer diameter less than that of said shoulder, so that the entire assembly may be inserted into the back end of said opening by rotation of the wrench engaging means of the sleeve.

4,215,715
POPPET VALVE

Paul Raskin, West Orange, N.J., assignor to General Pneumatics Corporation, Orange, N.J.

Division of Ser. No. 849,118, Nov. 7, 1977, Pat. No. 4,168,720, which is a continuation of Ser. No. 663,474, Mar. 3, 1976, abandoned. This application Feb. 22, 1979, Ser. No. 14,126
Int. Cl.[2] F16K *31/122*
U.S. Cl. 137—505.18 **3 Claims**

1. A poppet valve for a regulator for discharging fluid from a pressurized vessel comprising:

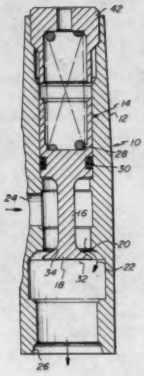
a piston including a stem and a disk-shaped head attached to said stem, said stem and said head each having a surface facing each other and on which opposite forces are applied by fluid from said pressurized vessel;

a cylinder defining a bore in which said piston is mounted for reciprocation, the internal wall of said cylinder having an annular beveled surface formed therein, said piston being movable relative to said cylinder to define a fluid flow orifice for the flow of fluid between said beveled surface and said piston head;

resilient means within said cylinder for applying a force on said piston to maintain said fluid flow orifice normally open; said cylinder wall including stop means for acting against said resilient means to stop said piston;

said disk-shaped piston head having a first face on one side thereof and a working surface on the opposite face thereof; said first face being flat in one plane and constructed and arranged to have a force applied thereto tending to partially restrict said fluid flow orifice while said working surface cooperates with said annular beveled surface to regulate and shape the flow of fluid through said orifice;

said working surface including an arc-shaped annular face, and a portion connecting said annular face to said stem; and

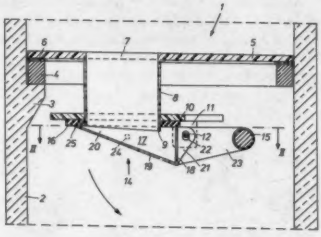


said arc-shaped annular face having a radius of curvature in the range of 0.156" to 0.252" to thereby significantly decrease the operating time of said valve to discharge fluid from said pressurized vessel via said flow orifice.

4,215,716
ONE-WAY CONDUIT CLOSURE

Adam Klenk, and Helmut Klenk, both of Asbacherstr. 5, 6101 Modautal, Ernsthofen, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,835
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1977, 2701157
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—527.4 **9 Claims**



5. A one-way closure for discharge conduits operative for preventing the escape of gases comprising, in combination, a mounting element connected to the discharge conduit interiorly thereof and subdividing the same into an upper and a lower compartment; an elongated connecting conduit sealingly connected to the mounting element and having an upper end portion communicating with the upper compartment, a lower end portion communicating with the lower compartment, and an internal surface bounding a liquid-flow path between the upper and lower compartments; a sealing ring arranged exteriorly of and above the lower end portion of the elongated connecting conduit; a cover having an upper side with a rim and two spaced ends; means mounting the cover for swinging movement about a generally horizontal first axis between a generally horizontal closed position in which the rim of the cover seal-tightly engages the sealing ring and a

downwardly swung open position, said mounting means including a mounting shaft defining said first axis; and means for normally swinging said cover into said closed position and including a counterweight with a lever, said cover being coupled midway between the end thereof with said lever of said counterweight for limited tilting movement relative thereto and said counterweight being also mounted on said mounting shaft for swinging movement also about said generally horizontal first axis, so that when said counterweight swings about said first axis it swings said cover about the same first axis with the limited tilting movement of said cover and thereby said rim of said cover seal-tightly engages said sealing ring.

4,215,717

UNIDIRECTIONAL VALVE

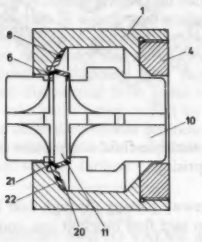
Paul Trösch, Schaffhausen, Switzerland, assignor to Georg Fischer Limited, Switzerland

Filed Jun. 9, 1978, Ser. No. 914,186

Claims priority, application Switzerland, Jun. 24, 1977, 7764/77

Int. Cl.² F16K *15/06, 15/14*

U.S. Cl. 137—533.25 **6 Claims**



1. A unidirectional valve comprising

a generally tubular housing having a through passage for substantially linear flow of a fluid medium, said housing having

an annular radially inwardly extending valve seat portion at one end thereof, and

means for defining coaxial guide holes at opposite ends of said housing;

a guide member extending axially through said guide holes, said guide member being axially slidable relative to said housing and including

a valve disc for carrying a valve member, and

means defining guide surfaces on opposite axial sides of said valve disc, said guide surfaces including a plurality of guide ribs extending radially outwardly from the central axis of said housing and extending through said guide holes;

a valve member carried by and axially movable with said valve disc within said housing by said medium between open and closed positions, said valve member comprising

a rigid annular portion fixedly attached to said valve disc,

a generally annular flexible portion extending outwardly from said rigid portion to form a control skirt which is foldable inwardly toward said rigid portion, and

means including a generally annular articulation film hinge interconnecting said rigid and flexible portions;

said rigid and flexible portions being axially movable with said guide member away from said valve seat to said open position by fluid flow in a first direction and being axially movable toward and into sealing engagement with said valve seat portion in said closed position by fluid flow in the opposite direction;

and wherein the passage through said housing includes

an interior cylindrical surface dimensioned to be contacted in sliding relationship by the periphery of said flexible portion of said valve member as said member moves to said closed position, and

means defining a tapered, generally frusto-conical surface extending outwardly from said valve seat portion to said cylindrical surface, said tapered surface being in abutting relationship with said flexible portion in said closed position.

4,215,718

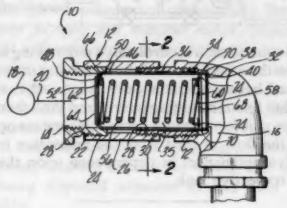
RELIEF VALVE

Borje O. Rosaen, 4031 Thornoaks Dr., and Dale P. Fosdick, 3000 Hunting Valley Dr., both of Ann Arbor, Mich. 48104

Filed Nov. 22, 1978, Ser. No. 963,035

Int. Cl.² F16K *15/02*

U.S. Cl. 137—543.19 **6 Claims**



1. A relief valve adapted for connection with a fluid system, said relief valve comprising:

an elongated housing having an inlet and an outlet;

an elongated fluid passage means formed through said housing and fluidly connecting said inlet to said outlet;

a valve means comprising a valve seat positioned in said fluid passage means adjacent said inlet and a valve member which cooperates with the valve seat to fluidly close the fluid passage means;

an elongated tubular member coaxially disposed within said fluid passage means, said tubular member having a plurality of longitudinally and circumferentially spaced apertures formed through it substantially along its entire length;

elongated resilient means for urging said valve member against said valve seat, said resilient means being positioned within said tubular member and having one end abutting against said valve member; and

means for adjustably varying the force with which said resilient means urges said valve member against said valve seat, said adjustable varying means further comprising a pin selectively disposed through substantially diametrically opposed apertures in said tubular member and abutting against the other end of said resilient member whereby the effective length of said resilient member can be varied by positioning said pin through longitudinally spaced pairs of apertures in said tubular member.

4,215,719

INTERMIXING OF FLUID IN PLURAL TANKS WHILE MAINTAINING THE FLUID LEVELS IN THE TANKS INDEPENDENT

Erwin Laar, Taufkirchen; Werner Sieber, and Josef Spickenreither, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Aug. 30, 1978, Ser. No. 937,944

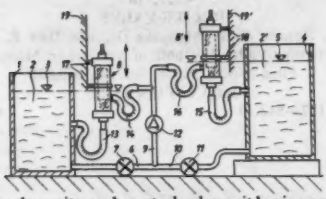
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1977, 2739292

Int. Cl.² F16K *31/22*; E03B *7/07*

U.S. Cl. 137—563 **12 Claims**

1. In combination with a plurality of fluid-filled tanks, especially corresponding tanks of plural photographic film developing machines, an arrangement for intermixing the fluid in the

plurality of tanks while maintaining the heights of the fluid in the plurality of tanks independent of each other, the arrangement comprising, in combination, a plurality of outflow conduits each connected to a respective tank for withdrawal of fluid therefrom; a common mixing conduit receiving fluid from the plurality of outflow conduits and including a mixing pump; a plurality of inflow conduits each connected to a respective tank for returning intermixed fluid thereto; and a plurality of



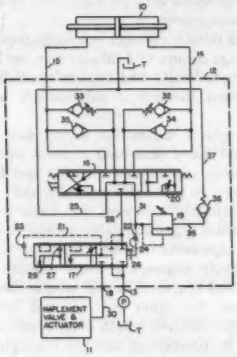
control valve units, each control valve unit having an inlet port connected to the mixing conduit for receiving intermixed fluid therefrom and having an outlet port connected to a respective inflow conduit for transmitting intermixed fluid thereinto, each control valve unit furthermore comprising means operative for controlling the flow of fluid from the respective inlet port to the respective outlet port in dependence upon the height of fluid in the respective tank.

4,215,720

FLUID CONTROL VALVE SYSTEM

Lanson Becker, Galesburg, Mich., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 2, 1978, Ser. No. 947,984
Int. Cl.[3] F15B *13/08*
U.S. Cl. 137—596.2 **5 Claims**



1. A fluid valve system, adapted to govern fluid power operation of first and second actuating means, the control valve system having metering directional control valve means for selectively governing passage of fluid from a supply passage to a first actuator feeder passages, and pressure compensating valve means for regulating flow through the directional control valve output port for power operation of the second actuating means wherein improved control apparatus comprises;

(a) a single main relief valve means connectable to each of said first actuator feeder passages and connected to the selected one of said first actuator feeder passages downstream from a metering portion of the directional control valve means for sensing a stalled condition of the first actuator, and

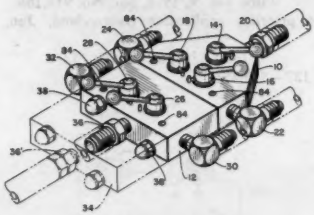
(b) means governed by the main relief valve means for delivering fluid to a tank from the supply passage through the metering portion of the directional control valve means and a relief passage including the main relief valve means upon sensing a stalled condition of the first actuator, and for delivering said fluid through the relief passage at a rate of flow which is limited only by the metering portion of the direction control valve means.

4,215,721

MODULAR MULTIPLE-FLUID COMPONENT SELECTION AND DELIVERY SYSTEM

Robert D. Hetherington, Sunland, and David W. Goelz, Burbank, both of Calif., assignors to Poly-Glas Systems, Sun Valley, Calif.

Filed Dec. 11, 1978, Ser. No. 968,609
Int. Cl.[2] F16K *11/22*
U.S. Cl. 137—606 **10 Claims**



1. A modular multiple-fluid component selection and delivery system comprising:

a first block;

a main passageway passing through said first block;

valve means in said first block at one end of said main passageway;

a plurality of secondary passageways intersecting said main passageway;

valve means intersecting each of said secondary said passageways for controlling the flow of the component to said main passageway;

at least one auxiliary block attached to said first block having a planar face abutting a planar face on said first block;

a main passageway in said auxiliary block in alignment with the main passageway in said first block;

said at least one auxiliary block having a plurality of secondary passageways intersecting with said main passageway;

aligning means automatically aligning the main passageway in said first block with the main passageway in said auxiliary blocks;

sealing means sealing the transition of the main passageway from block to block; and

a hose fitting attached to the end of the main passageway in the last of said plurality of blocks.

4,215,722

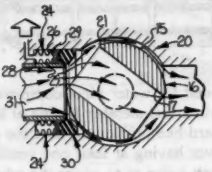
ROTARY FLOW REGULATING VALVE AND METHOD

James W. Sigmon, 2415 Knollwood Rd., Charlotte, N.C.

Filed May 13, 1976, Ser. No. 686,003
Int. Cl.[2] F16K *5/00*
U.S. Cl. 137—625.3 **7 Claims**

1. A rotary flow regulating valve comprising a valve member having a spherical sealing surface; a valve body with a conduit therethrough for operative communication with a fluid flow conduit, said valve body enclosing said valve member for defining therewith a circumferential flow path between said sealing surface and said valve body and a diametrical flow path through said valve member; cylindrical expansible bellows means mounted in said valve body and encircling said conduit therethrough and having a first end fixed stationarily relative to said valve body and a second end movable toward

the valve member on expansion of said bellows means; circular seal means encircling said conduit through said valve body and interposed between said second end of said bellows means and said valve member for movement between a position withdrawn from said valve member and a position in sealing engagement therewith; pressurizing fluid means operatively communicating with said bellows means for controllably pressurizing said bellows means independently of pressure conditions within said conduit and thereby for controllably urging said second end thereof toward said valve member and for imposing hoop stress on said seal means upon sealing engagement thereof with said sealing surface; and means for mounting said valve member for rotation within said valve body between a flow blocking position in which said sealing surface is disposed for sealing engagement of said seal means therewith and a full flow position, rotation of said valve member to intermediate rotational positions dividing fluid flow between said circumferential and diametrical flow paths with the ratio of division between said paths being varied by rotation of said valve member to a desired rotational position so as to regulate fluid flow through said body while maintaining distribution of fluid flow over said sealing surface.

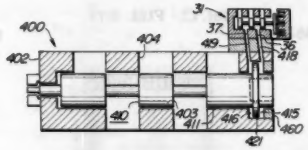


4,215,723

FLUID PRESSURE SERVO VALVE ASSEMBLY

Ken Ichiryu, Mito; Ichiro Nakamura, Katsuta, and Katsumasa Matsuura, Hitachi, all of Japan, assignors to Hitachi, Ltd., To:yo, Japan

Filed May 27, 1977, Ser. No. 801,302
Claims priority, application Japan, Jun. 11, 1976, 51-67641
Int. Cl.[2] F15B *13/043*
U.S. Cl. 137—625.63 **6 Claims**



1. A fluid pressure servo valve assembly driven by a pilot servo valve assembly for effecting control of the flow of a fluid flowing at a high flow rate from an actuating pressurized fluid source to apparatus to be driven by the fluid, comprising:

a single one piece valve body formed therein with a cylindrical bore having a central axis;

input port means opening in said cylindrical bore and communicating with said fluid source;

output port means opening in said cylindrical bore, being axially spaced from said input port means and communicating with the apparatus to be driven by the fluid;

a single one piece spool valve member including a plurality of integral axially spaced lands of substantially the same diameter as said cylindrical bore, with adjacent lands being interconnected by a neck of a smaller diameter than the lands;

said spool valve member being fitted completely within said cylindrical bore in said single valve body with axially reciprocating movement for bringing said output port means into and out of communication with said input port means;

an annular recess formed in one axial end of said body opening into the peripheral surface of and concentric with said cylindrical bore;

an annular end member having the same outer diameter as said annular recess and the same inner diameter as said cylindrical bore, said end member being sealingly fixed into the one axial end of said valve body to close the corresponding one axial end of said recess and thereby form an annular channel;

one of said lands at the corresponding one axial end of said spool valve member having an outer peripheral surface which cooperates with said body to close said annular channel throughout the axially reciprocating movements of said valve member to define an annular space;

an annular piston member of substantially the same outer diameter as said end member outer diameter, formed integral with said one land and extending outwardly from the outer peripheral surface of said one land into said annular space to divide said annular space into two pressure chambers out of communication with said ports at all times, said two pressure chambers having the same volume in one position of said spool valve member wherein said piston member is centered within said annular space and being disposed adjacent to said pilot servo valve assembly;

said piston member having two axially spaced pressure-receiving faces extending perpendicular to the axis of said cylindrical bore, respectively forming said two pressure chambers, and having the same effective area;

a pair of linearly extending fluid passages of equal length for respectively connecting said two pressure chambers to said pilot servo valve assembly with a minimum distance to introduce the actuating fluid from the pilot servo valve assembly alternately into one and the other of the two pressure chambers for causing the actuating fluid to act alternately on one and the other of said axially spaced pressure-receiving faces of said piston member thereby to reciprocally move said spool valve member in said cylindrical bore; and

a pilot servo valve assembly including two outlet ports directly connected to said fluid passages, respectively, control fluid inlet and exhaust ports for receiving and exhausting a control fluid signal, and slide fluid valve means proportioning the control fluid flow between said outlet ports in accordance with the magnitude of the control fluid signal.

4,215,724

BACKFLOW PREVENTER FOR SEWER SYSTEM

Duane D. Logsdon, Fullerton, Calif., assignor to The Logsdon Foundation, Stanton, Calif.

Filed Mar. 17, 1978, Ser. No. 887,828
Int. Cl.[2] F16K *15/14*
U.S. Cl. 137—852 **10 Claims**

1. A sewer line backflow preventer attaching to a sewer clean out pipe which comprises:

an upstanding pipe having an upper end and a lower end;

attaching means for attaching said pipe means to said sewer line;

cap means;

rigid support means for attaching said cap means to said pipe means;

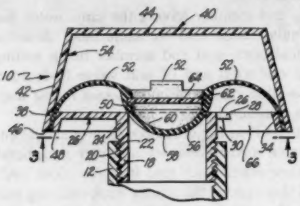
said rigid support means comprises a rigid support integrally formed with and radially projecting outwardly from the upper end of said pipe, said rigid support having at least one perforation wherein both air and sewage can pass through said rigid support;

said rigid support comprising a plurality of elongated

spokes, said spokes integrally formed with and radially projecting outwardly from the upper end of said pipe;

sealing means;

flexible support means for flexibly attaching said sealing means to said rigid support means such that said sealing



means is freely suspended within said cap means and under the influence of gravity fits against and seals said pipe means from the ambient environment and under the influence of fluid pressure within said pipe is lifted against gravity, opening said pipe means to allow egress of said fluid from said pipe means.

4,215,725

DEAERATING VALVE FOR BAGGING PULVERULENT PRODUCTS

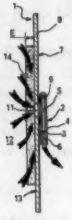
Robert Callet, and Henri Jeantet, both of Chaumont, France, assignors to Societe Anonyme des Imprimerie et Papeterie de l'Est., Chaumont, France

Filed Nov. 13, 1978, Ser. No. 960,102

Claims priority, application France, Nov. 17, 1977, 77 34659

Int. Cl.[2] B65B *1/26*

U.S. Cl. 137—855 **6 Claims**



1. Deaerating valve for a sack, notably an open-mouth sack designed to receive an atomized pulverulent substance, said valve comprising two superposed film elements fastened together so as to form a suction pocket constituting a fluid-tight inner space terminated by at least one suction channel, the outer surface of one of the elements being fixed to the outer surface of the wall of the sack along a closed contour which bounds a zone comprising perforations through said element and the wall, these perforations being arranged in opposite relationship so as to cause the interior of the sack to communicate with the interior of the pocket of the valve, and a filtering sheet or plate with a porous texture being applied on the internal surface of the perforated wall of the sack in front of the perforations, said filtering sheet being a draining sheet which extends well beyond the perforated zone along the wall of the sack and possesses a thickness and a surface area which are large with respect to the dimensions of the suction pocket to facilitate wick-like drainage of the air to the latter.

4,215,726

PROTECTIVE UNIT FOR WATER PIPES AND A METHOD FOR SETTING THE UNIT

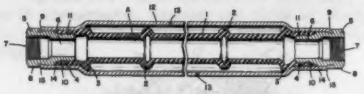
Masahiro Tagami, 6-94 Unuma, Ngamihara-shi, Gifu-ken, Japan

Filed Aug. 17, 1978, Ser. No. 934,507

Claims priority, application Japan, Aug. 23, 1977, 52-101851

Int. Cl.[2] E03B *7/10*

U.S. Cl. 138—30 **5 Claims**



1. A protective unit for water pipes comprising:

an expansible cylindrical member having at least one pleats and sword guard-like projections near the ends;

a cylindrical cover having at least one ventilations therein and having such a size as to cover the whole cylindrical member and such a configuration at its both ends as to closely hold the end portions of the cylindrical member; and

a metallic cap having a groove to firmly engage with said sword guard-like projections of the end portion of said cylindrical member and another groove to engage with the end portion of said cover.

4,215,727

PLASTIC WELL PIPE

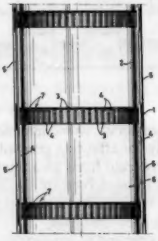
Hendrikus ter Wijlen, Rj De Krim, Netherlands, assignor to Wavin B.V., Zwolle, Netherlands

Filed Nov. 14, 1978, Ser. No. 960,667

Claims priority, application Netherlands, Nov. 18, 1977, 7712759

Int. Cl.[2] F16L *9/18*

U.S. Cl. 138—112 **10 Claims**



1. A plastic well pipe comprising an outer wall and an inner wall, longitudinal connecting partitions being integral with said inner and outer walls and extending thereinbetween, longitudinal capillary channels formed by the connecting partitions, said outer wall being perforated with bores, said bores opening at one end into said longitudinal capillary channels and at the other end into space outside of said outer wall whereby liquid flows through said bores and moves upwardly in said longitudinal channels by capillary action.

4,215,728
ELECTRONIC THREAD TRAVEL MONITORING DEVICE

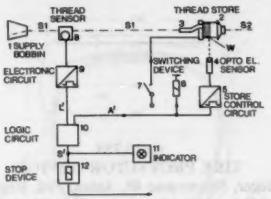
Erich Weidman, Wetzikon, and Walter Graf, Greifensee, both of Switzerland, assignors to Gebrüöü üÄü üÖ Öüäö

Filed Feb. 22, 1979, Ser. No. 13,969

Claims priority, application Switzerland, Mar. 3, 1978, 2568782/78

Int. Cl.[2] D03D *51/34*

U.S. Cl. 139—370.2 **5 Claims**



1. An electronic thread travel monitoring device on a weaving machine provided with stationary weft yarn supply means and intermittently actuatable thread storing means arranged on the same side of the weaving machine, comprising:

(a) thread sensing means arranged between the weft yarn supply means and thread storing means, for producing signals indicative of thread travel;

(b) store control means for producing actuating signals indicative of the condition "storing means depleted of yarn"; and

(c) logic means controlled by the thread travel signals and actuating signals, for producing output signals when no thread travel signal is present at any moment of the existence of an actuating signal.

4,215,729
WOVEN FASTENER STRINGER

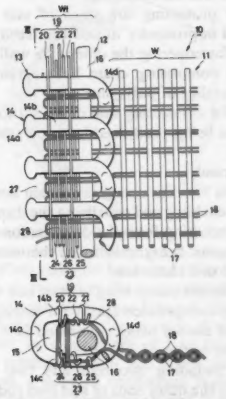
Masaatsu Ofusa, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,538

Claims priority, application Japan, Dec. 29, 1977, 52-5390

Int. Cl.[2] A44B *19/12*

U.S. Cl. 139—384 B **5 Claims**



1. A woven fastener stringer comprising a woven tape formed with foundation warp and weft threads and consisting of a web section defining a major dimension of said tape and a woven filament section defining a longitudinal edge portion of said tape; a row of successively interconnected elongated loops woven into said filament section, each of said loops having a coupling head at one end thereof, an upper leg and a lower leg extending from said head in a common direction and a heel portion remote from said head connected to a next adjacent one of said successive loops; a first binding warp system consisting of a plurality of exterior warp threads extending in parallel longitudinally of said tape and overlying the upper legs of successive ones of said elongated loops, and an interior warp thread extending longitudinally of said tape and underlying the upper legs of said loops; and a second binding warp system consisting of a plurality of exterior warp threads extending in parallel longitudinally of said tape and underlying the lower legs of successive ones of said loops and an interior warp thread extending longitudinally of said tape and overlying the lower legs of said loops, said first and second binding warp systems being interwoven in the spaces between each adjacent pair of said loops with the portions of said foundation weft thread which are laid in double picks into said woven filament section.

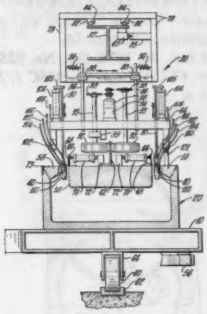
4,215,730
METHOD AND APPARATUS FOR DEPOSITING MATERIAL INTO A MOVING RECEPTACLE

Leo A. Oswald, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 651,308, Jan. 22, 1976, Pat. No. 4,075,301. This application Feb. 17, 1978, Ser. No. 878,559

Int. Cl.[2] B65B *3/04*; B29C *1/00*

U.S. Cl. 141—1 **18 Claims**



14. A method for depositing material into a moving receptacle comprising:

a. moving a receptacle along a straight line path;

b. discharging material from a movable discharge means into said moving receptacle;

c. continuously sensing movement of said receptacle during said discharging;

d. moving said discharge means over a predetermined path relative to said receptacle responsive to said sensing; and,

e. moving said discharge means in a predetermined pattern of speeds relative to the speed of said receptacle responsive to said sensing, whatever the movement of said receptacle.

4,215,731
ROUTER GUIDE ASSEMBLY

Douglas E. Maynard, 13216 Leach St., Sylmar, Calif. 91342

Filed Dec. 26, 1978, Ser. No. 972,932

Int. Cl.[3] B27G *13/00*

U.S. Cl. 144—136 C **8 Claims**

1. A router guide assembly comprising:

a table;

at least one fence secured to said table;

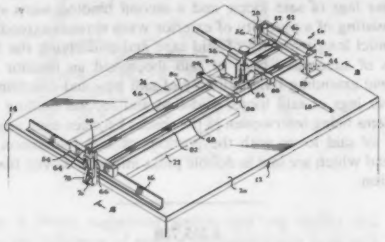
two parallel guide rails;

means for pivotally mounting said guide rails so that they

can swing from an open position away from said table to an active position adjacent said table;

a carriage movably mounted on said guide rails for carrying a router parallel to said guide rails for routing a workpiece positioned on said table;

a front crossbar and a rear crossbar, said guide rails having ends engaged in said front and rear crossbars;



said rear crossbar being pivotally mounted with respect to said table and slidably mounted in a direction toward and away from said table by means of a roller on each end of said rear crossbar engaging in an upright slot in a stand secured to said table.

4,215,732

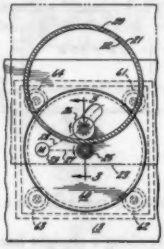
PATTERN-CONTROLLED ROUTING MACHINE

Donald A. Novinger, Western Springs, Ill., assignor to Danly Machine Corporation, Chicago, Ill.

Filed Oct. 30, 1978, Ser. No. 955,940

Int. Cl.[2] B27C *5/02*; B23C *1/18*

U.S. Cl. 144—145 A **12 Claims**



1. In a routing machine especially intended for routing a 360° non-linear groove at one end of a flat longitudinally extensive workpiece, the combination comprising a frame, an extensive work support on the frame, a routing tool journaled in the frame perpendicularly and opposite to the work support and having means for rotating the same at high speed, a pattern in the form of a curved rib extending about an angle of 360° temporarily secured to the underside of the workpiece and having a radially facing reference surface and an opposite surface, the surfaces being generally parallel to one another and extending at right angles to the workpiece, a reference roller journaled in a position centrally of the work support and engaging the reference surface on the pattern, the reference roller being permanently mounted in coaxial alignment with the routing tool, a cooperating roller engaging the opposite surface on the pattern and having biasing means for pressing the cooperating roller toward the reference roller and into engagement with the pattern, means for driving the rollers so that the pattern is advanced between the rollers carrying with it the workpiece which moves relatively to the routing tool to produce a groove shaped in accordance with the pattern, and means for mounting the cooperating roller so it is bodily freely swingable about the axis of the reference roller so that when the rollers complete a traverse of the 360° pattern the cooperating roller also undergoes a change of orientation of 360° with respect to the reference roller, the workpiece being freely supported with respect to the work support for shifting movement in all directions thereby enabling the workpiece to be retained in its initial orientation free of lateral swinging movement during the cut regardless of changes in the direction taken by the pattern.

4,215,733

TIRE PROTECTOR DEVICE

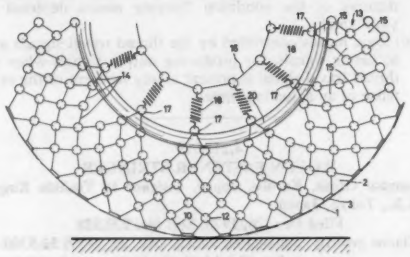
Hansjörg Rieger, Saarstrasse 48, Aalen, Fed. Rep. of Germany (7080), and Erhard Weidler, Jahnstrasse 32, Aalen-Unterkochen, Fed. Rep. of Germany (7084)

Filed Nov. 2, 1977, Ser. No. 847,702

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2651162; Nov. 5, 1976, 2651163

Int. Cl.[2] B60C *27/20*

U.S. Cl. 152—171 **6 Claims**



1. A tire protector device for mounting on a tire and wheel flange adjacent thereto including:

a cover for protecting tire tread of said tire, said cover positioned in proximity to said tire tread;

a chain net for covering the outer side wall of said tire, said chain net comprising chain links arranged together to form a plurality of polygons;

first means for connecting said chain net to said cover, said first means being positioned between said cover and said chain net;

a holding strand;

second means for connecting said chain net to said holding strand for enabling and equalizing the displacement of said chain net resulting from the deformation of said tire, said second means being positioned between said holding strand and said chain net;

said second means comprising at least one device including at least one compression spring for storing compressional forces, said device being positioned in a radial direction towards the center of said tire;

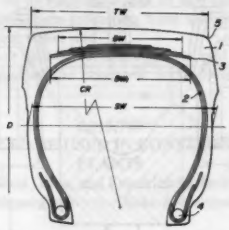
said device including two rods and two connector eyes mounted to the outer ends of said two rods, two compression springs surrounding said two rods respectively, a strain cam positioned between said two rods for connecting the inner ends of said two rods, and stop means associated with said two rods such that said two rods are movable with respect to said stop means against the action of said compression springs.

4,215,734

PNEUMATIC TIRE HAVING A DURABLE TREAD OF WIDE WIDTH

Yasuo Suzuki, Akigawa; Akira Tamura, and Kenji Matsumoto, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Aug. 10, 1978, Ser. No. 932,573
Claims priority, application Japan, Aug. 17, 1977, 52-97763
Int. Cl.[2] B60C *11/00, 3/00, 9/20*
U.S. Cl. 152—209 WT 3 Claims



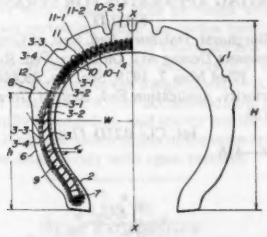
1. A pneumatic tire comprising a durable tread of wide width, the width TW of said tread being 0.8–1.0 times the section width SW of the tire, a carcass and a multiply belt interposed between the tread and the carcass and having a high rigidity, characterized by: the width BW of a main belt being limited to 0.85–0.48 times the tread width TW, the maximum belt ply width BW_1 being limited to 0.85 times the tread width TW, and the crown radius CR of the wide-width tread being limited to 0.5–0.8 times the outer diameter D of the tire.

4,215,735

SAFETY PNEUMATIC TIRES

Takeshi Sato, Akigawa, Japan, assignor to Bridgestone Tire Company Limited, Kyobashi, Japan

Filed Mar. 2, 1978, Ser. No. 883,082
Claims priority, application Japan, Apr. 8, 1977, 52-39561
Int. Cl.[2] B60C *9/00*
U.S. Cl. 152—354 R 7 Claims



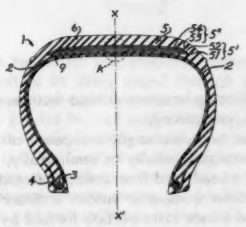
1. A safety pneumatic tire for motorcyles compising a toroidal shaped carcass having rubberized cord plies extending between a pair of left and right beads and said cords of the plies being inclined with respect to the equatorial plane of the tire and being crossed with each other between said plies, a tread having a large width on a crown portion of said carcass and extending parallel to a curvature of said carcass, sidewalls connecting said tread to each of said beads with substantially uniform thickness, a sidewall reinforcing layer comprising a rubber which is partially meniscus-shaped in section and disposed along said carcass in each sidewall, said sidewall reinforcing layer having a thickness required for supporting the load which is subjected to the tire when it is punctured and a modulus of elasticity at 100% elongation of 40 to 120/kg/cm^2 and made integral with said bead, a tread reinforcement comprising at least one rubber layer having a modulus of elasticity which is greater than a modulus of elasticity of ply coating rubber of the carcass and interposed between plies of the carcass, and a first and a second cord layer in which cords are inclined with respect to the equatorial plane of the tire at an angle which is greater than an angle formed by cords of the carcass plies with respect to the equatorial plane of the tire, said first cord layer being disposed on the underside of the carcass and said second cord layer is disposed on the overside of the carcass; and a relatively narrow zone formed on the carcass between said sidewall reinforcing layer and said rubber layer and which is easily susceptible to bending deformation, said narrow zone being located at a position which is a height (h) of 50% to 75% of a section height (H) of the tire, wherein the height (h) is a distance from a bead base to the center of the narrow zone in the radial direction of the tire and the section height (H) is a distance from the bead base to a top of the tread in said direction.

4,215,736

RADIAL TIRE WITH CROWN REINFORCEMENT BLOCK OF TWO SUPERIMPOSED PAIRS OF PLIES

Yves Herbelleau, Riom, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Mar. 30, 1979, Ser. No. 25,393
Claims priority, application France, Apr. 7, 1978, 78 11275
Int. Cl.[2] B60C *9/18, 9/20*
U.S. Cl. 152—361 R 5 Claims



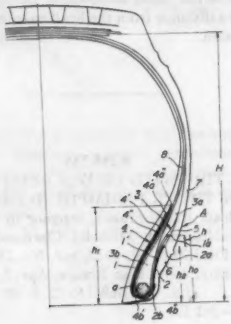
1. A tire with a radial carcass reinforcement anchored in each bead to at least one bead ring and with a crown reinforcement formed, in addition to the portion of the radial carcass reinforcement concerned, by four working plies crossed from one ply to the other forming an angle of between 10° and 45° with the longitudinal direction of the tire and each having the same thickness and same rigidity to extension per unit of width, the said four working plies being arranged radially outward of the radial carcass reinforcement, characterized by the fact that the four working plies form a block of two superimposed pairs of plies of cables parallel in each ply and crossed from one ply to the next with respect to the longitudinal direction, the plies of the first pair which is radially closest to the radial carcass reinforcement forming angles β_1 and β_2 of arithmetic average equal to β radian and the plies of the second pair forming angles α_1 and α_2 of arithmetic average equal to α radian, the difference $\beta-\alpha$ radian being at least equal to the value of the expression $h \sin (\beta+\alpha)/2z$, β being greater in absolute value than α, z being the distance from the middle fiber of the radial carcass reinforcement to the interface between the two pairs of four working plies, and h being the thickness of each working ply, z and h being measured along the intersection of the equatorial plane with the tire and the angles α_1, α_2 and β_1, β_2 differing by at most 0.026 radian from the angles α and β, respectively, the angles α_1, α_2, β_1, β_2 being measured with respect to said intersection.

4,215,737

STRUCTURE FOR REINFORCING BEAD SECTIONS OF RADIAL TIRES FOR HEAVY LOADS

Kenichi Motomura, Higashi-Murayama; Mitsuhisa Yahagi, Sayama, and Toshiyuki Sogi, Higashi-Yamato, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Jun. 16, 1978, Ser. No. 916,429
Claims priority, application Japan, Jul. 5, 1977, 52-80287
Int. Cl.[2] B60C *15/00, 15/06*
U.S. Cl. 152—362 R 9 Claims



1. A reinforcing structure at bead sections of radial tires for heavy loads, comprising;

(1) at least one carcass ply composed of rubberized cord layer arranged radially or semiradially, which is turned around a bead cord from inside to outside of the tire,

(2) a circular composite rubber stiffener being disposed between a case main portion formed by the carcass ply and the turned-over carcass protion, extending outwardly in radial direction of the tire from bottom end adjacent to the bead core and composed of a lower half rubber stock portion having a higher modulus and an upper half rubber stock portion having a lower modulus, said upper half portion being arranged along the end portion of the inside of the turned-over carcass ply,

(3) at least one chafer composed of rubberized metal cords crossed with the ply cords being disposed in a circular region at the outside of the turned-over carcass ply so that said chafer end does not extend to the turned-over carcass ply end, and

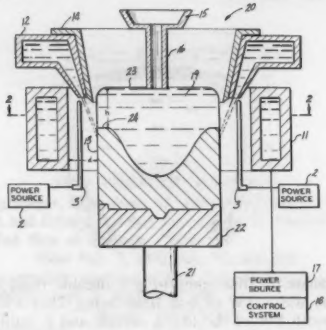
(4) a reinforcing member composed of at least two rubberized organic fiber cord layers arranged in bias, which are disposed directly in contact with the composite stiffener along the case main portion or secured to the inside of the ply cord of the case main portion and crossed with the ply cord and crossed with each other, said reinforcing member being locked with the bead base and disposed along a circular region of a radial height h_1 of said reinforcing member end from the bead base being 0.85–2.6 times as high as a perpendicular height h_2 of the upper end of the chafer from the bead base, the organic fiber cord being crossed at an angle of 50° to 60° with respect to the ply cord of the main case portion near the position of the point crossing to the axial direction line passing the turn-over end of the carcass ply.

4,215,738

ANTI-PARALLEL INDUCTORS FOR SHAPE CONTROL IN ELECTROMAGNETIC CASTING

Gerhard K. Gaule, Elberon, N.J.; John C. Yarwood, Madison, and Derek E. Tyler, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 30, 1979, Ser. No. 25,493
Int. Cl.[3] B22D *11/01, 27/02*
U.S. Cl. 164—49 11 Claims



1. A process for obtaining fine shape control during electromagnetic coating of molten metal or alloy into an ingot of desired shape comprising:

establishing a molten metal casting zone;

providing a main inductor in surrounding relation to said zone;

placing at least one anti-parallel inductor pair between said main inductor and said casting zone;

passing a current through said main inductor to generate a first primary electromagnetic field in said casting zone;

passing a lesser current through said at least one anti-parallel inductor pair to generate a second electromagnetic field in said casting zone; and

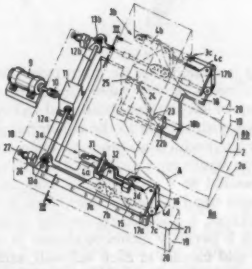
pouring said molten metal or alloy into said casting zone.

4,215,739

OSCILLATING APPARATUS FOR STRAND CASTING MOLD

Friedhelm Borghorst, Duisburg, Fed. Rep. of Germany, assignor to Mannesmann Demag AG, Duisburg, Fed. Rep. of Germany

Filed May 7, 1979, Ser. No. 36,404
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822138
Int. Cl.[2] B22D *11/04*
U.S. Cl. 164—416 18 Claims



1. Apparatus for reciprocating a strand casting mold lift table, comprising

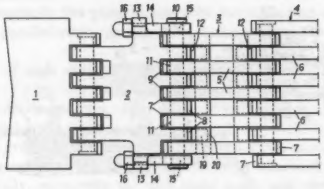
(a) a guide for said apparatus positioned parallel to the cast strand path;

(b) motor means for reciprocating said apparatus;
(c) a pair of bearing support points for said table extending from the bottom of each side of said table;
the improvement characterized by
(d) a rocker lever connected to each said bearing point;
(e) an articulated axle between each said bearing point and its respective rocker lever;
(f) an annular resilient support element surrounding each said axle;
(g) a thrust rod on each side of said table;
(h) one end of each said thrust rod connected to said pair of rocker levers on its respective side of said table;
(i) eccentric drive means extending from said motor means to each side of said table; and
(j) the end of each said thrust rod opposite said pair of rocker levers connected to said eccentric drive means.

4,215,740
STARTER BAR TO BE USED IN CONTINUOUS CASTING PLANTS

Werner Scheurecker, Linz, and Friedrich Ippisch, Ebensee, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 3, 1978, Ser. No. 957,664
Claims priority, application Austria, Dec. 14, 1977, 8915/77
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—446 **7 Claims**



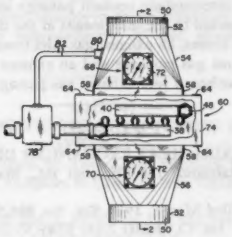
1. In a starter bar to be used in continuous casting plants and of the type including a starter bar head, linked bodies immediately following said starter bar head, and hinge pin means pivotally interlinking said linked bodies into a chain, each linked body being formed of substantially parallel members connected together, neighbouring ones of said linked bodies having members with engaging ends provided with overlapping recesses and pertaining hinge pin means penetrating said recesses, the improvement which is characterized in that the recesses provided at the ends of the members of at least one of said linked bodies are open in the longitudinal direction of the starter bar, and that tensile-forces-accommodating connecting means are laterally arranged on said starter bar for connecting the ends of the hinge pin means adjacent the open recesses with said at least one linked body with open recesses.

4,215,741
HEAT EXCHANGER

Martin P. Averbuch, 166-25 Powells Cove Blvd., Beechhurst, N.Y. 11357, and Jack A. Averbuch, 768 Jefferson St., Baldwin, N.Y. 11510

Filed Aug. 3, 1978, Ser. No. 930,608
Int. Cl.[3] G05D *23/00*; F28F *7/00*
U.S. Cl. 165—11 R **1 Claim**

1. A heat exchanger adapted for facilitated positioning and removal in relation to a heat exchange station preparatory to extracting heat from combustion gases during the exiting flow thereof through an exit conduit, the said heat exchanger comprising four vertically oriented walls operatively arranged in facing relation to define an open rectangular frame of a selected size in excess of said exit conduit to contribute to unimpeded movement therethrough of said combustion gases, a sinuous arrangement of water-circulation conduits disposed in spanning relation between an opposing two of said walls for positioning said conduits transversely across said flow path of said combustion gases, movement-guiding surfaces extending laterally along opposite edges of each said wall for establishing contact with cooperating surfaces of said exit conduit of said combustion gases, whereby said heat exchanger is adapted to be urged through opposite direction sliding movement while supported by said established contact of said cooperating surfaces to thereby contribute to the facilitated positioning at and removal thereof from said heat exchange station, plural heat exchange fins supported transversely of and in spaced relation along said water-circulation conduits to contribute to maximizing the extent of heat extracted from said combustion gases, said spaces between adjacent fins being of an optimum nominal extent of approximately ⅜ of an inch and effectively maintained free of any clogging material incident to the facilitated removal of said heat exchanger for periodic cleaning, the ends of said water-circulation conduits being arranged to project beyond said one supporting wall serving as the front of said frame, and at least one additional horizontally oriented conduit being connected to said projected ends to provide fluid communication therebetween, whereby said additional conduit also effectively serves as a handle for conveniently gripping said heat exchanger incident to its being urged through said sliding movements, the ends of said water-circulation conduits are arranged to also project beyond said other supporting wall serving as the rear of said frame, and said movement-guiding surfaces of said rear wall extend an appropriate distance in relation to said projected ends to serve as stops protecting said ends against damaging contact during the positioning of said heat exchanger at said heat exchange station, said exit conduit of said combustion gases having connected to openings thereof in facing relation to each other a corresponding facing pair of cooperatively outwardly diverging conduit members for enlarging the size of said flow path of said combustion gases and there is a rectangular housing connected in an interposed position between said flow path-enlarging conduit members for slidably receiving said heat exchanger, and a thermostat being operatively associated with each said flow path-enlarging conduit members, whereby a comparison of the temperatures recorded on said thermostats is effective in indicating the temperature drop in said combustion gases flowing through said heat exchange station.



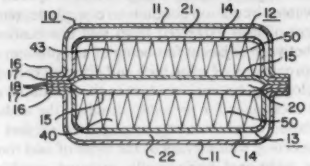
4,215,742
EXHAUST COOLERS

Lauren R. Weed, Jamestown, N.Y., assignor to Blackstone Corporation, Jamestown, N.Y.

Filed May 15, 1978, Ser. No. 905,860
Int. Cl.[3] F01P *3/00*
U.S. Cl. 165—51 **10 Claims**

1. An exhaust gas cooler for motor vehicles for land operation capable of cooling the entire exhaust gas output comprising an elongate outer housing, a pair of spaced apart generally parallel inner housings extending lengthwise of the outer housing and interconnected at their ends, said inner housings being spaced from the outer housing to form a pair of interconnected generally parallel exhaust gas passages within said outer hous-

ing, at least two generally parallel and interconnected coolant passages formed by and between the walls of said inner and outer housings and substantially surrounding said inner housings, multiple heat transfer means in at least a part of each of said inner housings contacting the walls thereof, an intermediate coolant passage between said exhaust gas passages, coolant inlet means into at least two of said coolant passages including said intermediate coolant passage adjacent one end thereof,



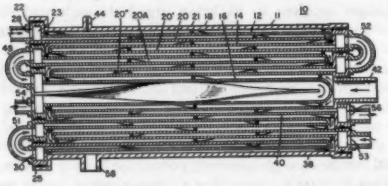
coolant exhaust means communicating with at least two of said coolant passages including any passage not connected to the inlet means, said coolant exhaust means including a connection between said intermediate coolant passage and said any passage not connected to the inlet means at the other end remote from the inlet means, an exhaust gas inlet connected to one of said two exhaust gas passages and an exhaust gas outlet connected to the other of said exhaust gas passages.

4,215,743

COAXIAL HEAT EXCHANGER DEVICE

Thomas B. Margittai, 778 Cornwall Rd., State College, Pa. 16801

Filed Mar. 8, 1978, Ser. No. 884,554
Int. Cl.[3] F28D 7/00; F28F 9/22
U.S. Cl. 165—141 **9 Claims**



1. Apparatus for heating or cooling liquid in a heat exchanger, comprising in combination:

a cylindrical shell;

a plurality of annular concentric heating chamber cartridge means within said cylindrical shell;

means for removably mounting said annular concentric heating chamber cartridge means in said cylindrical shell;

said means for removably mounting comprising a plurality of annular concentric mounting member cartridges having internal chamber means therein, one set of said mounting member cartridges being located on one end of said shell and another set of said mounting member cartridges being located on the other end of said shell and placed in alternate sequence;

liquid inlet means for admitting a liquid heating or cooling medium within said chamber means,

said chamber means being arranged to provide a plurality of axially extending, coaxial annular spaces for passing said liquid heating or cooling medium therein;

means for interconnecting said annular spaces;

liquid outlet means,

said liquid inlet means for the liquid heating or cooling medium, each communicating with one coaxial annular space on each cartridge and liquid outlet means for the liquid heating or cooling medium each communicating with the internal chamber of the adjacent chamber cartridge means;

parallel mounting members comprising a hollow flange with two half circular chambers;

dividers within said mounting member cartridges which separate said internal chamber means into two inter-connected helical flow paths and which separate said hollow flange into two half circular chambers,

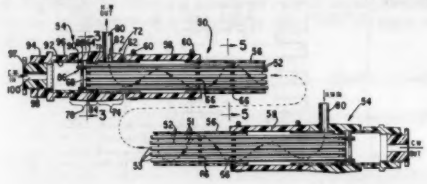
said half circular chambers in communication with said heating chamber means.

4,215,744

HEAT EXCHANGER

Vernon O. Bowles, Naples, Fla., assignor to Solartrap, Inc., Naples, Fla.

Filed Jun. 30, 1978, Ser. No. 920,849
Int. Cl.[3] F28F 9/02, 9/24
U.S. Cl. 165—158 **18 Claims**



1. In a heat exchanger including hollow shell means defining an elongate space for circulation of a first fluid therethrough, a plurality of elongate tubes spaced apart inside said shell means to conduct a second fluid therethrough in heat exchange relation with fluid in said space, and means at each end of said shell means for coupling an end thereof with adjacent ends of said tubes and conducting the respective fluids separately into or from said tubes and said space without leakage, the improvement wherein each said coupling and conducting means comprises:

a socket member comprising forward and backward socket portions and an annular shoulder portion protruding inwardly between them, said forward portion being connected in fluid-tight relation to an end portion of said shell means and having a passageway extending through it for conducting said first fluid into or from said space;

a rigid tube support displaceable axially in said backward socket portion, said tube support having a plurality of ports therein, said adjacent ends of said tubes extending past said shoulder portion into said backward socket portion and said tubes being fixed and sealed respectively in said ports of said tube support;

a compressible sealing ring in said backward portion between said shoulder portion and a circumferential portion of said tube support outside the tubes;

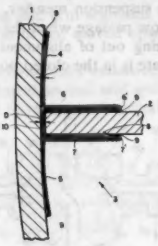
means confined in said backward socket portion but accessible through its backward end for displacing said tube support to a position in which it compresses said sealing ring against said shoulder portion, thereby isolating said tube ends from said first fluid space, and

means connected with said backward socket portion for conducting said second fluid into or from said tube ends.

4,215,745
PARTITIONED HEAT-EXCHANGER SHELL

Hans-Joachim Tückmantel, Mülheim an der Ruhr, Fed. Rep. of Germany, assignor to Kempchen & Co. GmbH, Oberhausen, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,157
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, [DE] 2712207
Int. Cl.[2] F28F *9/22*
U.S. Cl. 165—160 6 Claims

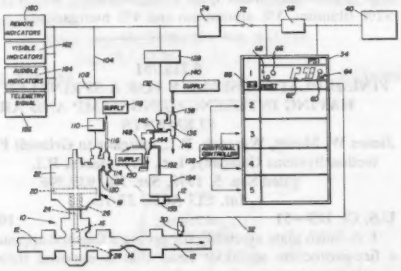


1. A heat-exchanger shell comprising:
a substantially cylindrical tube having an inner wall and a central axis;
a substantially flat plate in said tube having a pair of generally parallel edges juxtaposed closely with said inner wall; and
a pair of seals each unitarily formed of sheet metal with a pair of generally parallel inner flanges defining a groove in which a respective outer edge of said plate is snugly received with said inner flanges elastically bearing against and gripping the respective edge and a pair of oppositely outwardly extending flanges bearing elastically tightly radially outwardly on said inner wall, said sheet metal being folded over double at said inner flanges and forming a fold at the radially inner edge of each of said inner flanges.

4,215,746
PRESSURE RESPONSIVE SAFETY SYSTEM FOR FLUID LINES

Donald F. Hallden, Garland; Clifford M. Peters, and L. V. McCary, Jr., both of Longview, all of Tex., assignors to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Jun. 28, 1979, Ser. No. 53,134
Int. Cl.[3] E21B *34/16, 43/12;* F16K *17/00, 37/00*
U.S. Cl. 166—53 28 Claims

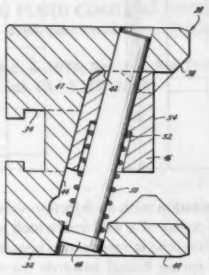


1. In a safety system for a fluid flowline having a safety valve movable between open and closed positions to respectively open and close the flowline, the improvement comprising:
pressure transducer means for sensing the fluid pressure in the flowline and providing an electrical signal indicative of the sensed fluid pressure;
electrical control means having a low setting corresponding to a preselected low pressure level in the flowline and a high setting corresponding to a preselected high pressure level in the flowline, said control means receiving the electrical signal from said transducer means and detecting when said signal is within a predetermined range defined between said low setting and said high setting;
valve actuator means for maintaining said safety valve in the open position when the signal detected by said control means is within said predetermined range and for moving the safety valve to the close position when the signal detected by said control means is outside of said predetermined range;
means for maintaining said safety valve in the closed position when the signal provided by said transducer means returns to said predetermined range after having been detected outside of said predetermined range;
manually operated means to override said means for maintaining said safety valve in the closed position for reopening said safety valve; and
manually operated shutdown means effective to close said safety valve independently of said electrical control means.

4,215,747
BLOWOUT PREVENTER WITH TUBING ALIGNING APPARATUS

Fern H. Cox; William M. Taylor, and Friedrich E. Just, all of Houston, Tex., assignors to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 5, 1978, Ser. No. 912,378
Int. Cl.[2] E21B *33/06*
U.S. Cl. 166—85 4 Claims



1. A blowout preventer with a pipe aligning apparatus for positioning a pair of pipes in a well bore for engagement by the blowout preventer, comprising
a housing having a vertical bore therethrough,
said housing having ram guideways perpendicular to and extending from said bore,
rams in said guideways and having means for moving said rams inward and outward therein,
said blowout preventer closing and sealing on the pair of pipes when a plane passing through the axes of the pipes is substantially perpendicular to the axis of the ram guideways,
aligning guideways spaced from and parallel to said blowout preventer ram guideways,
an aligning ram positioned in each of said aligning guideways and having means for being moved radially inward and outward of said housing bore,
each aligning ram having,
a carrier slidable in the aligning ram guideway, and having a

cam surface facing said bore in a vertical plane at an angle to the axis of the aligning ram guideways,

a flange extending forward into said bore on at least one side of said carrier and being tapered to urge pipes away from the sides of said bore, and

a jaw movably mounted on said carrier and having a cam surface engaging the cam surface of said carrier and a surface facing said housing bore substantially parallel to the axis of said vertical bore,

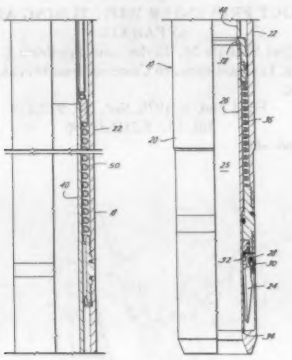
the cam surfaces of the opposing rams coacting so that when their jaws engage pipes within said housing bore in a position preventing closing of the blowout preventer, the jaws slide transversely of the associated guideway in substantially opposite directions whereby the pipes are brought into a position with their axes lying in a plane substantially perpendicular to the axis of the blowout preventer ram guideways to allow closing of and sealing by the blowout preventer.

4,215,748

LOCKOUT FOR A WELL INJECTION VALVE

Clare A. Pace, Anchorage, Ak., and Ronald E. Pringle, Houston, Tex., assignors to Camco, Incorporated, Houston, Tex.

Filed Jan. 11, 1979, Ser. No. 2,650
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—322 **2 Claims**



1. In combination with an injection valve for injecting fluids in the tubing string of a well and which is opened by pressure actuating a flow tube in response to injection flow in which the flow tube is spring biased towards the closed position, of a valve lockout comprising,

a second flow tube coaxially aligned with the first flow tube for engagement therebut but unconnected thereto,

piston means connected to the second flow tube and adapted to be actuated by fluid pressure from the well surface for moving the second flow tube against the first flow tube for holding the injection valve open, and

biasing means acting against the second flow tube for moving the second flow tube away from the first flow tube whereby the injection valve may operate normally.

4,215,749

GATE VALVE FOR SHEARING WORKOVER LINES TO PERMIT SHUTTING IN OF A WELL

Roy R. Dare, and Jeff L. Merten, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

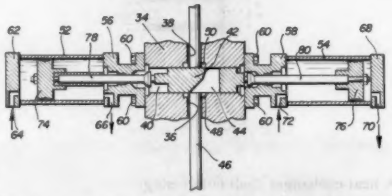
Filed Feb. 5, 1979, Ser. No. 9,018
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—361 **10 Claims**

1. A gate valve for closing in a well and for cutting an elongate suspension member extending into the well through a wellhead assembly, said gate valve comprising:

a valve body adapted to be mounted on the wellhead assembly, said valve body presenting a valve chamber and a flow passage which communicates with the well and is of sufficient size to receive the suspension member;

a gate mounted in said valve chamber for substantially horizontal movement between an open position and a closed position relative to said flow passage;

a flow port formed through said gate and sufficient in size to receive the suspension member, said port being aligned with said flow passage when the gate is in the open position and being out of alignment with the flow passage when the gate is in the closed position;



a pair of annular valve seats mounted in said valve body about said flow passage at locations adjacent the valve chamber, said seats cooperating with said gate to close said flow passage when the gate is in the closed position;

actuator means for forcefully moving said gate from the open to the closed position; and

a cutting edge of said flow port located adjacent the upper surface of the gate, said cutting edge having a thickness of between approximately $\frac{1}{4}$ inch and $\frac{3}{8}$ inch and being adapted to cooperate with one of said valve seats to effect shearing of the suspension member upon movement of said gate to the closed position to close said flow passage, said one valve seat being an upper valve seat located above the gate and presenting a corner area for cooperation with said cutting edge to effect shearing of the suspension member.

4,215,750

HORSESHOE

Ronald H. Fields, Hopbine, Roman Rd., Herefordshire, and Allan G. McLeod, Elan, The Portway, Burghill, Herefordshire, both of England

Filed Nov. 7, 1978, Ser. No. 958,583
Int. Cl.[2] A01L *1/00*
U.S. Cl. 168—4 **6 Claims**

3. A horseshoe made from a titanium alloy which comprises 92% titanium, 4% aluminium and 4% manganese.

4,215,751

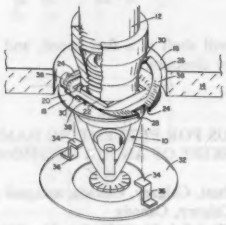
FINISH PLATE ASSEMBLY FOR A SPRINKLER HEAD HAVING INTERENGAGING RAMP AND ARM ELEMENTS

James W. Mears, Warwick, R.I., assignor to Grinnell Fire Protection Systems Company, Inc., Providence, R.I.

Filed Sep. 5, 1978, Ser. No. 939,396
Int. Cl.[2] A62C *37/10*
U.S. Cl. 169—51 **10 Claims**

1. A finish plate assembly for giving a finished appearance to a fire-protection sprinkler head that is exposed through an opening in a room surface such as a suspended ceiling wherein the installed height and angular orientation of said ceiling with respect to a pre-installed sprinkler head is variable, thereby determining a range of variation of relative distances normal to said ceiling between adjacent portions of said opening and said sprinkler head, said assembly comprising:

a finish plate member, said member including
an exposed exterior surface of sufficient width to extend beyond the periphery of said opening,
an interior surface for orientation toward said ceiling, said interior surface including a planar contact surface for engagement with said ceiling outside the periphery of said opening, and
two or more arms each having a radially-extending segment; and
a receptor fixed to said sprinkler head, said receptor including
openings for receiving said arm segments when said finish plate member and arms are moved upward toward said fixed receptor,
two or more circumferentially-extensive, resilient ramp elements for attachment around said sprinkler head, and
a central opening for receiving said sprinkler head,



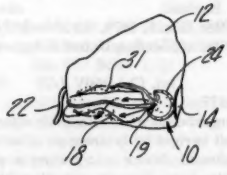
each of said ramp elements having a top surface defining an upwardly-sloping surface for engaging a bottom surface of one of said radially-extending arm segments and urging said finish plate member upwardly by an increasing amount as said finish plate member is rotated about its axis in relation to said fixed receptor during installation,
the upward extent of each said sloping surface being greater than said range of variation,
said resilient ramp elements being downwardly deflectable with further rotation of said finish plate member after said contact surface of said finish plate member engages said ceiling, and
the resiliency of said ramp elements being selected to maintain contact between said contact surface and said ceiling despite, with passage of time, further variation of said relative distances within said range.

4,215,752

VEHICULAR FIRE SUPPRESSANT SYSTEM HAVING A FRANGIBLE FIRE EXTINGUISHANT HOUSING

Gail J. Waller, Centerline, Mich., assignor to Kenneth W. Gerow and Joyce M. Gerow, both of Snover, Mich., part interest to each

Filed Sep. 18, 1978, Ser. No. 943,136
Int. Cl.[2] A62C *35/12, 37/14*
U.S. Cl. 169—58 **4 Claims**



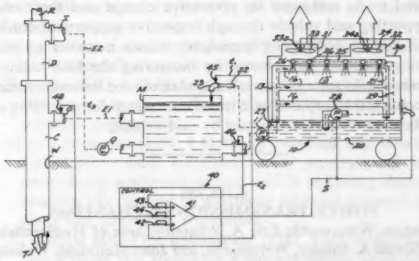
1. In combination with a vehicle having a body, a fuel tank secured to the body adjacent its rear end, the forward side of said fuel tank having a predetermined width, and a relatively stationary member secured to the vehicle body forwardly of the fuel tank, a fire suppressant system comprising:
an elongated tubular and cylindrical housing constructed of a frangible material, said housing having a length at least as great as the width of the forward side of said fuel tank;
means for closing both ends of the housing to thereby define a closed housing chamber;
said housing chamber being filled with a pressurized liquid fire suppressant material;
means for securing said housing to said vehicle body so that said housing extends laterally across the forward side of the fuel tank; and
wherein the forward displacement of the fuel tank crushes said frangible housing between said fuel tank and said stationary member and releases the fire suppressant material over said fuel tank; wherein said means for closing the ends of the housing comprises an end cap secured across each axial end of the housing, each said end cap having a surface which protrudes concavely inwardly toward the housing chamber, said end caps being structurally stronger than said housing; a nipple secured to one of said end caps, said nipple having one end open to said housing chamber and another end accessible exteriorly of the end cap, fluid passage means extending between the ends of the nipple and a one way valve disposed in the fluid passage means, said one way valve being normally held in a closed position by the pressure within the housing chamber and operable, upon opening, to permit said housing chamber to be filled with said fire suppressant material; at least a portion of said housing extending above the fuel tank, a horizontal centerline of the housing being positioned above a horizontal centerline of the fuel tank so that upon rupture of the housing, a substantial portion of said fire suppressant material is expelled over the top of the fuel tank.

4,215,753

DRILLING FLUID COOLING SYSTEM

Elwood Champness, 2104 Sherwood Ave., Bakersfield, Calif. 93304

Filed Dec. 4, 1978, Ser. No. 966,157
Int. Cl.[2] E21B *21/00*
U.S. Cl. 175—17 **5 Claims**



1. In a well drilling facility comprising a well bore extending into the ground and having received on the interior thereof a hollow drill pipe terminating in a drill tip, a well fluid pump for pumping well fluids down through said drill pipe towards said drill tip and for returning said fluids through the well bore to the ground surface, and a well fluid container connected to be evacuated by said well fluid pump and adapted to receive said well fluids from said well bore, the improvement comprising:
a radiator assembly including a plurality of elongate tubular members connected to communicate between an inlet manifold and an outlet manifold;
a wheeled platform attached to support said radiator assembly and including a liquid collection trough aligned subjacent said elongate members;

transfer means connected between said inlet and outlet manifolds and said container for circulating said well fluid between said radiator assembly and said container;

air cooling means deployed adjacent said elongate members for drawing air thereacross at a rate corresponding to the amplitude of a control signal;

water spray means deployed adjacent said elongate members and connected to communicate with said liquid collection trough for drawing water from said trough and ejecting said water in a spray onto the exterior surfaces of said elongate members at a rate corresponding to the amplitude of said control signal; and

control means connected to sense the temperature of said well fluid for producing said control signal proportional thereto.

4,215,754

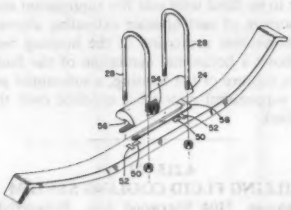
LOAD MEASURING SYSTEM FOR LEAF SPRING SUSPENSIONS

Thomas H. Hagedorn, Seattle, and Allen L. DeForrest, Auburn, both of Wash., assignors to Structural Instrumentation, Inc., Tukwila, Wash.

Filed Nov. 20, 1978, Ser. No. 962,207

Int. Cl.[2] G01G *19/08, 3/14*

U.S. Cl. 177—137 **10 Claims**



1. A system for measuring the load carried by a vehicle having a pair of leaf springs positioned on opposite sides of said vehicle with each leaf spring having a structural member secured to its mid-point by respective clamps and their ends supporting said vehicle through respective support structures, said system comprising transducer means mounted on said springs beneath said clamps for measuring the load induced strain of said springs beneath said clamps, and indicator means receiving the output of said transducer means for providing an indication of the load carried by said vehicle.

4,215,755

POWER TRANSMISSION MECHANISMS

Norman Waterworth; Eric A. Whateley, both of Huddersfield; Gerald A. Shipley, Worplesdon, and John McKnight, Woking, all of England, assignors to David Brown Gear Industries Limited, Huddersfield, England

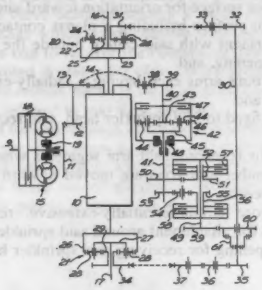
Filed Oct. 23, 1978, Ser. No. 953,791

Claims priority, application United Kingdom, Oct. 25, 1977, 44272/77

Int. Cl.[2] B62D *11/10*

U.S. Cl. 180—6.44 **8 Claims**

1. In a power transmission mechanism of the type having two output shafts adapted to be drive connected to respective propulsion means disposed at opposite sides of a vehicle, a steering mechanism for simultaneously causing the rotational speed of either one of said shafts to increase and that of the other of said shafts to decrease comprising a null shaft driveable in either direction of rotation to effect steering by varying the relative rotational speeds of the output shafts as aforesaid, and a variable mechanical two-speed drive taken from the input side of the power transmission mechanism operable for



rotating the null shaft at a first speed, and then at a higher speed, in either direction.

4,215,756

APPARATUS FOR PREVENTING DAMAGE TO THE FLEXIBLE SKIRT OF AN AIR CUSHION VEHICLE, BY ICE

Rowland D. Hunt, Calgary, Canada, assignor to Hoverlift Systems Ltd., Calgary, Canada

Filed Jul. 21, 1978, Ser. No. 926,851

Int. Cl.[2] B60V *1/16, 1/18*

U.S. Cl. 180—127 **10 Claims**

1. In an air cushion vehicle including a hull having a peripheral bottom surface and a plurality of adjacent flexible skirt members attached to said surface, the improvement comprising apparatus for protecting said skirt members, said apparatus comprising: a plurality of rigid, vertically oriented web members, each of said web members having a rearward portion extending in between adjacent ones of said skirt members for attachment to said surface and a forward portion extending beyond the outer periphery of said skirt members; and means for rigidly interconnecting said forward portions, said interconnecting means being spaced from said outer periphery of said skirt members.

4,215,757

ATTACHMENT DEVICE FOR RELEASABLY CONNECTING FLEXIBLE SKIRT COMPONENTS TO AN AIR CUSHION VEHICLE

John Henry, Cowes, and John E. Dadswell, Newport, both of England, assignors to British Hovercraft Corporation Limited, Yeovil, England

Filed Dec. 6, 1978, Ser. No. 967,013

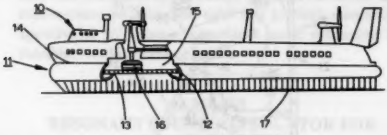
Claims priority, application United Kingdom, Dec. 28, 1977, 54021/77

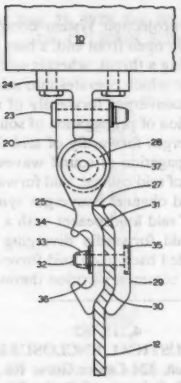
Int. Cl.[3] B60V *1/16*

U.S. Cl. 180—127 **7 Claims**

1. An attachment device for releasably connecting a flexible skirt component to rigid body structure of an air cushion vehicle, said attachment device comprizing a plurality of first elements each having a passage extending therethrough and being arranged for attachment to the rigid body structure of the vehicle so as to be in spaced relationship with next adjacent first elements and with the passages in said first elements sub-

stantially aligned, a plurality of second elements each having a curved clamping face and a recess on the opposite face and a passage extending therethrough, said plurality of second elements being arranged for attachment in spaced relationship to next adjacent second elements along an edge portion of flexible sheet material forming a component of a flexible skirt and with the passages in said second elements substantially aligned, a pin member for insertion in the aligned passages of said first and second elements when said second elements are located in the spaces between the first elements whereby said first and second elements are connected in hinged relationship to each other,





and a plurality of curved clamping plates having a curved clamping face and a recess on the opposite face and being arranged for co-operation one with each said second element so as to present a curved clamping face towards a complementary curved clamping face on said second element, one face being generally concave and the other face being generally convex whereby in use an edge portion of flexible sheet material forming said skirt component is positioned between said curved clamping faces and held by a clamping action that is applied by releasable fastening means which pass through aligned holes in said second element, said clamping plate, and said flexible material.

4,215,758

SPRAYING APPARATUS EMPLOYING A SKIRT STRUCTURE

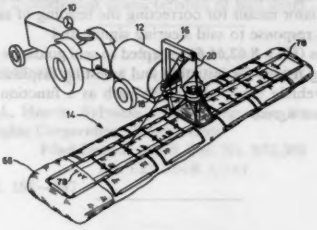
Derek Jones, Hamilton, Canada, assignor to A. C. Sprayers Inc., Hamilton, Canada

Continuation-in-part of Ser. No. 820,110, Jul. 29, 1977, abandoned. This application Aug. 2, 1978, Ser. No. 930,208

Int. Cl.[2] B60V *1/16*

U.S. Cl. 180—128 **5 Claims**

1. A bag skirt construction for an air supported apparatus comprising two spaced parallel air-receiving passages surrounding an air-receiving enclosure open to the ground and constituting respective parts of at least one air bag, and an end closure member for closing the adjacent ends of the said spaced parallel passages and also the respective end of the said enclosure zone, the closure member comprising an envelope disposed over the adjacent ends of the said spaced parallel passages and overlapping said ends, wherein the air received in the passages expands the respective portions of the passages



within the envelope into sealing engagement with the envelope.

4,215,759

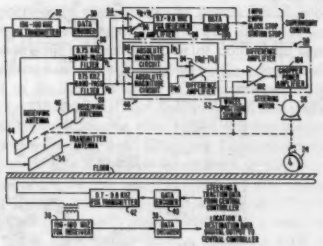
GUIDANCE CONTROL SYSTEM FOR A TRACTION VEHICLE

Ricardo A. Diaz, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 642,805

Int. Cl.[2] B60K *41/00*; B62D *1/24*

U.S. Cl. 180—168 **10 Claims**



1. A guidance control system for the discipline of a traction vehicle comprising:

(a) a plurality of discrete antennae (FIG. 7:12,14) arranged in tandem to define a guide path;

(b) means (FIG. 1:40,42) adjacent said guide path for sending steering and traction coded intelligence to said plurality of antennae respectively;

(c) antenna means (FIG. 1:44,46) for receiving said steering and traction coded intelligence, said receiving antenna means being positioned on said vehicle and being electromagnetically coupled to proximate antennae successively along said guide path respectively;

(d) antenna means for transmitting (FIG. 1:34) mounted on said vehicle, said transmitting antenna means being electromagnetically coupled to a proximate one of said discrete antennae;

(e) transmitter means (FIG. 1:30,32) on said vehicle coupled with said transmitting antenna means for sending destination coded intelligence to said transmitting antenna means;

(f) means (FIG. 1:36,38) adjacent said guide path for receiving and decoding said destination coded intelligence from said discrete antennae respectively with the vehicle location being signified by detection of the particular discrete antenna providing the coupling for the vehicle transmission;

(g) decoder means (FIG. 1:58) coupled to said receiving antenna means for receiving and decoding said traction coded intelligence and delivering traction signals;

(h) guidance demodulating means (FIG. 1:48) coupled to

said receiving antenna means for receiving and decoding said steering coded intelligence and for delivering a steering signal;

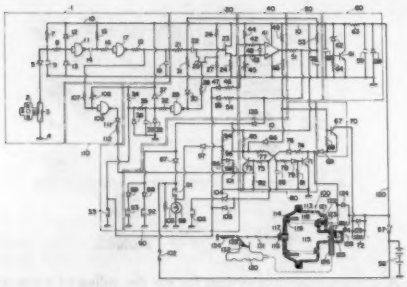
(i) steering control means (FIG. 1:50) coupled to said demodulator means for correcting the heading of said vehicle in response to said steering signal; and

(j) means (FIG. 8:62,64,66) coupled to said guidance demodulating means for initiating and arresting displacement of said vehicle along said guide path as a function of said traction signal.

4,215,760
AUTOMOBILE SPEED CONTROL SYSTEM

Naoji Sakakibara, Chiryu, and Shoji Kawata, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 21, 1978, Ser. No. 888,801
Claims priority, application Japan, Mar. 22, 1977, 52-31294; Mar. 24, 1977, 52-32499
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—176 **4 Claims**



1. Automobile speed control system for maintaining the actual automobile speed at a desired automobile speed and having a throttle valve and comprising:

an actual speed generator circuit which generates a first electrical signal indicating actual automobile speed;

circuit means providing a negative feedback signal substantially corresponding to the position of the throttle valve;

memory circuit means including at least a set switch operable to OPEN and CLOSED positions, a memory member to which a superposed signal consisting of the first electrical signal and the negative feedback signal is applied, and a memorization control circuit which energizes the memory member to memorize the superposed signal, as the desired automobile speed, in correspondence with the operation of the set switch;

comparator circuit means for combining said first electrical signal, the memorized superposed signal of the memory circuit means and the negative feedback signal to provide an error signal;

converter means to convert the error signal to mechanical movement of the throttle valve;

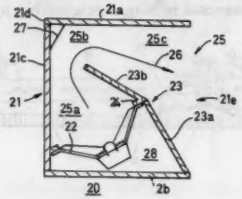
a self-maintaining circuit which is set by the operation of the set switch to enable throttle valve position control operation of the converter means with the error signal; and

a speed set control circuit means including at least a switch for cancelling the setting of the self-maintaining circuit.

4,215,761
BASS SOUND PROJECTION SYSTEMS

Anthony J. Andrews, Ridge Farm, Rusper Rd., Capel, Surrey, England

Filed Nov. 2, 1978, Ser. No. 957,308
Claims priority, application United Kingdom, Nov. 4, 1977, 45927/77
Int. Cl.[2] H05K *5/00*
U.S. Cl. 181—152 **3 Claims**

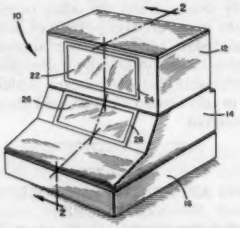


1. A bass sound projection system comprising a cabinet having an acoustically open front end, a bass loudspeaker, and a sound channel having a throat, wherein said cabinet contains said bass loudspeaker which operates into said sound channel, said sound channel converges forwardly of said loudspeaker relative to the direction of propagation of sound waves to said throat and then diverges forwardly of said throat relative to the direction of propagation of sound waves to said acoustically open front end of said cabinet, said forwardly converging portion of said sound channel converges symmetrically with respect to the axis of said loudspeaker with a relatively gentle convergence, and said forwardly diverging portion of said sound channel is folded back upon said forwardly converging portion and shares a common partition therewith.

4,215,762
ACOUSTICAL ENCLOSURE

Donald R. Cunningham, 324 Center Grove Rd., Randolph, N.J. 07801, and James E. Sulewsky, 7 Drake Rd., Mendham, N.J. 07945

Filed May 24, 1979, Ser. No. 42,238
Int. Cl.[3] B41J *29/08*
U.S. Cl. 181—201 **10 Claims**



1. An enclosure for acoustically isolating an automatically operated machine, said enclosure comprising:

a base portion having an open top and a partial bottom panel upon which said machine rests and having an air-intake opening at the bottom of said base portion,

a midsection portion having an open top and bottom and being hingedly attached at one edge to said base portion and being formed to circumferentially conform with the top edge of said base portion,

a top portion having a closed top and and open bottom and being formed so that the bottom edges circumferentially conform with the top edges of said midsection portion,

first and second strips of gasket material arranged between the lower edges of said midsection portion and the upper edges of said base portion,

third and fourth strips of gasket material arranged between the upper edges of said midsection portion and the lower edges of said top portion, and

exhaust fan means mounted on said midsection portion for drawing air into the air-intake opening in said base portion, past the machine and exhausting the air from the enclosure, whereby said first and second strips of gasket material and said base portion and said midsection portion and said third and fourth strips of gasket material and said mid-section portion and said top portion cooperate, respectively, to contain acoustical noise produced by the machine within the enclosure.

4,215,763

RESONANT SOUND ATTENUATOR FOR TRANSFORMERS

Walter J. Pasko, Lee, Mass., assignor to General Electric Company

Filed Aug. 21, 1978, Ser. No. 935,343
Int. Cl.³ H02K *5/24*
U.S. Cl. 181—202 **3 Claims**

1. A method for attenuating noise from a vibrating transformer casing comprising the steps of:

determining the regions of the transformer casing that are in vibration;

attaching a plurality of metal plate-capped resin bodies to the regions of the transformer casing that are in vibration; and

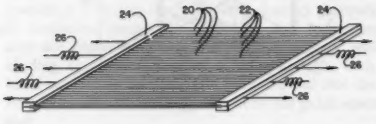
adjusting the mass of the metal plates to cause the metal plates to vibrate 180 degrees out of phase with the transformer casing and to generate acoustic energy in proportion to said vibration for destructive cancellation of sound waves produced by said vibrating casing.

4,215,764

ACOUSTIC FILTER

Roy D. Marangoni, Pittsburgh, Pa.; Horst Gigerenzer, Hollis Center, and Roger T. Pepper, Cape Elizabeth, both of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Jul. 1, 1976, Ser. No. 701,562
Int. Cl.³ E04B *1/62*
U.S. Cl. 181—286 **12 Claims**



1. A tunable sound insulating panel assembly comprising in combination:

a fiber reinforced lead composite sheet having acoustical frequency transmission and absorption characteristics and

means for applying a predetermined tensile stress along said sheet so as to modify said acoustical frequency absorption and transmission characteristics of said sheet.

4,215,765

ACOUSTICAL WALL BAFFLE AND METHOD OF MAKING

David A. Harris, Sylvania, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 26, 1978, Ser. No. 973,308
Int. Cl.² E04B *1/343*
U.S. Cl. 181—287 **3 Claims**

1. A method of making an acoustical wall baffle, adapted to be mounted perpendicularly to a wall and to extend from the ceiling to the floor or to a floor cabinet, by clamping together the frame portions of two composite panels which would be used to hang the panels separately flatwise against a wall, the method comprising providing a pair of composite acoustical panels of appropriate size for the wall baffle, each panel being constructed in the same manner as an acoustical wall panel intended to be mounted flatwise against a wall and including a generally rectangular fibrous glass board, a frame surrounding the board and including four elongated frame portions, each frame portion having a channel in which a respective one of four edge portions of the board is received and including a generally T-shaped rear mounting foot strip portion integral with the channel, normally engageable with a wall, and enabling the panel to be hung flatwise against a wall on wall brackets concealed thereby, and a decorative fabric on a front side of the board, placing the panels together back-to-back with the rear mounting foot strip portion of each frame portion of one panel in abutting relationship with the rear mounting foot strip portion of a corresponding frame portion of the other panel, and clamping the abutting rear mounting foot strip portions together, by applying generally U-shaped clamping strips over the outer leg portions of the heads of the abutting T-shaped rear mounting foot strip portions on at least a pair of opposite frame portions of each of the frames, to secure the panels together back-to-back and thereby form said acoustical wall baffle.

4,215,766

CONSTRUCTION MODULE

Reginald D. Littlefield, and Stuart Shinn, both of Toronto, Canada, assignors to Supreme Aluminum Industries, Ltd., Scarborough, Canada

Filed Dec. 22, 1978, Ser. No. 972,385
Claims priority, application Canada, Nov. 30, 1978, 317149
Int. Cl.² E06C *1/10, 7/08*
U.S. Cl. 182—46 **7 Claims**

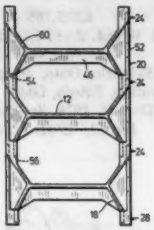
1. A construction module comprising:

a horizontal rung means having two ends,

two identical side means, one attached to the end of the rung means,

each side means having an upwardly extending portion extending above the rung means and a downwardly extending portion extending beneath the rung means,

the upwardly and downwardly extending portions of such shape and size so that a first inner section of the upwardly extending portion of a lower module will lie in touching contact along an overlap area with an outer section of the upwardly extending portion of a higher module and at the



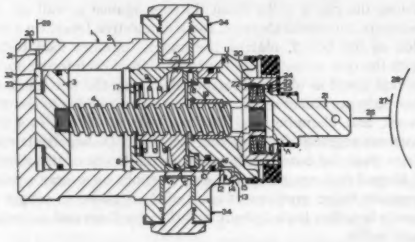
same time an outer section of the downwardly extending portion of the higher module lies in touching contact along the overlap area with a second inner section of the upwardly extending portion of the lower module when the two modules are assembled to form a completed structure.

4,215,767

PARKING BRAKE DEVICE

Frank W. Shirey, N. Huntingdon, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 10, 1978, Ser. No. 932,591
Int. Cl.[2] B60T *17/16*
U.S. Cl. 188—265 **6 Claims**



1. A parking brake device for use on a vehicle having a wheel and a brake shoe for applying a braking force to the wheel, said parking brake device comprising:

(a) power piston means operable to a brake application position for effecting operation of the brake shoe to a brake-applying position in which a braking force is exerted on the wheel;

(b) locking means for locking said power piston means in said brake application position; and

(c) resilient means operable by movement of said power piston means to said brake application position to a compressed state for generating a compressive force acting in a direction coinciding with that of said braking force,

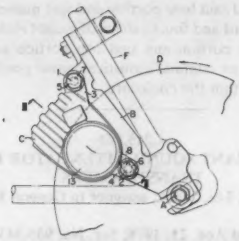
(d) said compressive force being effective, in the event of loss of effectiveness of the power piston means, for maintaining the brake shoe in its said brake-applying position.

4,215,768

CALIPER SUPPORTING DEVICE IN A DISC BRAKE FOR VEHICLES

Masayuki Seki, Tateshina, Japan, assignor to Nissin Kogyo Kabushiki Kaisha, Ueda, Japan

Filed Feb. 7, 1979, Ser. No. 10,158
Claims priority, application Japan, Mar. 18, 1978, 53-31412
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **2 Claims**



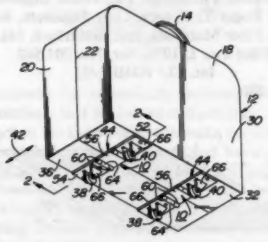
1. An improved caliper supporting device in a disc brake for vehicles, comprising; a bracket secured to a body of a vehicle, a caliper arranged astride of a part of a brake disc and being pivotally and slidably supported at one end thereof on said bracket by a first slide pin, said first slide pin extending in a direction of the axis of rotation of said brake disc, a second slide pin fixedly mounted on one of the other end of said caliper and said bracket, said second slide pin extending in the direction of the axis of rotation of said brake disc and being adapted to loosely fit in a support hole in the other of said other end of said caliper and said bracket, and a resilient grommet mounted in said support hole for resiliently supporting said second slide pin and thereby slidably supporting said other end of said caliper on said bracket, the improvement comprising: having said support hole formed as an elongated hole extending in a direction toward said first slide pin to thereby provide a clearance space between the second slide pin and the ends of said elongated hole; said resilient grommet being disposed in said clearance spaces to resiliently support said second slide pin only in the lengthwise direction of said elongated hole; and said grommet being opened sidewise of said elongated hole for permitting direct engagement of said second slide pin with the side walls of said elongated hole, when a braking torque is applied to the caliper.

4,215,769

WHEELED BAGGAGE HINGE SYSTEM

Anthony Kuc, 601 S. Providence Rd., Wallingford, Pa. 19063

Filed Jul. 9, 1979, Ser. No. 55,912
Int. Cl.[3] A45C *5/00*; E05D *3/06*
U.S. Cl. 190—18 A **10 Claims**



1. A wheeled baggage hinge system for coupling a luggage bag lid element and a bottom element in rotative displacement,

said lid and bottom elements each having a respective sidewall and bottom wall comprising:

(a) at least a pair of wheel elements secured respectively to a lower surface of said bottom walls of said lid and bottom elements, said wheel elements being substantially aligned each with respect to the other in a transverse direction; and,

(b) luggage hinge means secured to said bottom walls of said luggage lid and bottom elements for rotative displacement therebetween, said lid element and said bottom element being transversely displaced each from the other by a distance sufficient to provide non-interference of said wheel elements when said lid and bottom sidewall elements are positionally located in contact interface with a substantially horizontal base surface, said wheel elements being secured to said luggage hinge means.

4,215,770

CONDUCTIVE RAIL ASSEMBLY

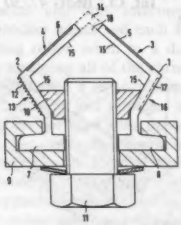
Uwe Bormann, Rummingen, Fed. Rep. of Germany, assignor to Wampfler GmbH, Weil am Rhein-Markt, Fed. Rep. of Germany

Filed May 23, 1978, Ser. No. 908,609

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739481

Int. Cl.[2] B60M *1/30*

U.S. Cl. 191—23 R **11 Claims**



1. A rail guide assembly uniquely constructed for maintaining electrical contact with a trolley-like vehicle without allowing the buildup of excessive heat within said rail guide assembly, and comprising:

first and second spaced rail guide assemblies extending substantially parallel to one another, each of said rail guide assemblies having a substantially constant thickness and a substantially V-shaped profile with closed end portions of said V-shaped profiles extending substantially away from one another;

each of said first and second rail guide assemblies further including a separate support flange attached to a respective first end portion thereof, with said flange members and said respective first end portions extending substantially perpendicular to one another;

at least one band of conductive material extending along a surface of said first V-shaped rail guide assembly facing substantially away from said second V-shaped rail guide assembly and at least one separate band of conductive material extending along a surface of said second V-shaped rail guide assembly facing substantially away from said first V-shaped rail guide assembly, wherein said bands of conductive material engage and transmit electrical current to a trolley-like vehicle in contact therewith;

first connector means for enclosing and supporting said separate flange members, said first connector means including an aperture extending therethrough, with a fastener projecting through said aperture and into the space between said first and second spaced rail guide assemblies; and

second connector means positioned between said first and second rail guide assemblies and adjustably mounted on said fastener for contacting and wedging said first and second rail guide assemblies substantially away from one another to secure and maintain engagement between said bands of conductive material and said trolley-like vehicle.

4,215,771

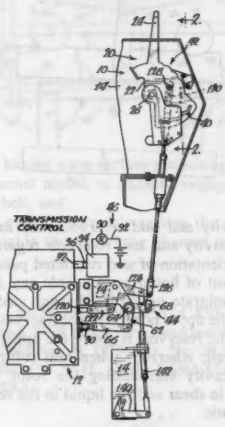
SINGLE LEVER CONTROL SYSTEM

Thomas W. Huitema, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Mar. 8, 1978, Ser. No. 884,647

Int. Cl.[2] G05G *9/08*; B60K *41/22, 41/28*

U.S. Cl. 192—3.54 **1 Claim**



1. A control system for simultaneously controlling movement of a plurality of control elements forming part of a transmission control through movement of a single control lever, which transmission includes a manually operated clutch engageable and disengageable to control said transmission, a support, a control lever supported on a fixed axis on said support and pivotable to a plurality of distinct positions, an operative connection between said clutch and said control lever for moving said control lever to a position corresponding to the lowest forward speed when said clutch is moved to a disengaged position, said control lever having at least first and second camming surfaces, first means between said first camming surface and a first of said control elements for causing shifting of said first control element in response to pivotal movement of said control lever, second means between said second camming surface and a second of said control elements for causing shifting of said second control elements in response to pivotal movement of said control lever, said camming surfaces being configured so that only one or both of said first and second control elements is shifted in response to pivotal movement of said control lever from one distinct position to another distinct position.

4,215,772

RETARDER FOR GRAVITY CONVEYORS

James T. Graham, Rochester, Mich., assignor to F. Jos. Lamb Company, Warren, Mich.

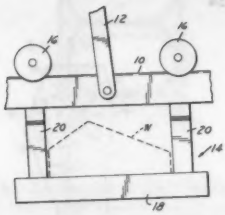
Filed May 29, 1979, Ser. No. 43,252

Int. Cl.[2] B65G *13/00*

U.S. Cl. 193—35 A **9 Claims**

1. In a gravity conveyor of the type having a work support member mounted on a frame member for rotation about a generally horizontal axis in response to gravitational forces generated by the weight of a load supported by the rotatably member the combination comprising a housing fixedly mounted on said frame member and having a cylindrical cavity

therein coaxial with the axis of rotation of the rotatable member, said rotatable member having an axial extension projecting into said housing, a rotor fixed on said extension and disposed within said cavity for rotation therein, the outer surfaces of said rotor being spaced from and relatively closely adjacent the walls of said cavity, said housing having an annular reservoir therein spaced radially outwardly of and surrounding said cavity and separated therefrom by an annular wall, said wall having a plurality of generally uniformly circumferentially spaced restricted radial passageways therein extending be-



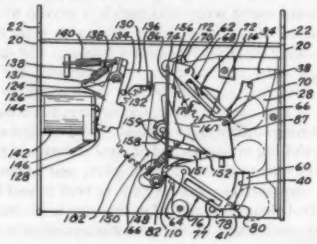
tween said cavity and said reservoir, and means permitting filling of said cavity and said reservoir regardless of the circumferential orientation of said restricted passageways with a sufficient amount of liquid as to enable any air entrapped in said cavity to migrate upwardly through said restricted passageways into the upper portion of the reservoir and so that the liquid level in the reservoir is above the uppermost portion of said annular wall, whereby, when said rotor is rotated, the liquid in the cavity surrounding the rotor is agitated and thereby placed in shear and the liquid in the reservoir remains substantially static.

4,215,773

COIN-HANDLING DEVICE

Raymond A. Johnson, Hot Springs, Ark., assignor to U.M.C. Industries, Inc., New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,481
Int. Cl.[2] G07F 5/16
U.S. Cl. 194—9 R **41 Claims**



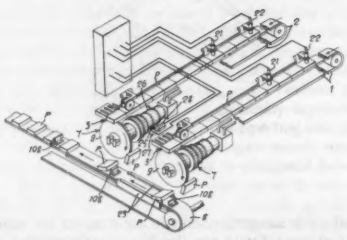
36. A coin-handling device which can accept a coin and establish a credit corresponding to the value of that coin and which comprises a movable credit-establishing element that can be advanced to establish a predetermined credit corresponding to one half of the value of said coin, a passageway for said coin, a switch, an electromechanical actuator which responds to closing of said switch to initiate an advancement of said movable credit-establishing element, a first coin-receiving element which responds to the insertion of said coin to effect a first closing of said switch, a second coin-receiving element which responds to the insertion of said coin to effect a second closing of said switch, said first coin-receiving element and said second coin-receiving element being disposed along the length of said passageway so said coin successively engages and moves said first coin-receiving element to provide said first closing of said switch and then engages and moves said second coin-receiving element to provide said second closing of said switch, said engagement and movement of said first coin-receiving element and of said second coin-receiving element by said coin effecting two successive closings of said switch and thereby causing said electromechanical actuator to initiate two successive advancements of said movable credit-establishing element to establish two said predetermined credits.

4,215,774

TRANSFERRING AND COMBINING DEVICE

Renato Manservisi, Bologna, Italy, assignor to CIR-S.p.A.-Divisione SASIB, Bologna, Italy

Filed Sep. 6, 1978, Ser. No. 940,139
Claims priority, application Italy, Sep. 21, 1977, 12771 A/77
Int. Cl.[2] B65G 47/30
U.S. Cl. 198—444 **3 Claims**



1. A device for transferring and combining articles which are advanced successively on at least two parallel conveyors (**1** and **2**), in such a manner as to form a single row of articles which are fed successively the one after the other on a transversal conveyor (**8**) arranged transversally and at a lower level with respect to the said parallel conveyors (**1** and **2**) characterized in that at the delivery end of each parallel conveyor (**1**,**2**) there is arranged a revolving transfer wheel (**7**) which transfers the articles from the respective parallel conveyor successively onto the said lower transversal conveyor (**8**), the said transfer wheels (**7**) being arranged one after the other with respect to the direction of conveyance of the transversal conveyor and being driven in such a manner that each article deposited by the second transfer wheel, i.e. the wheel which is arranged subsequently after the other transfer wheel, or first wheel, in the direction of conveyance of the transversal conveyor, comes to lie on the said transversal conveyor between two articles deposited by the first preceding transfer wheel and wherein each said transfer wheel comprises a plurality of extendible and retractable engaging elements arranged radially on said transfer wheel and means for controlling the extension of said engaging elements so that they project radially into operative position and the retraction of said engaging elements so that they retract into inoperative position, said engaging elements being adapted to engage the articles abutting against an abutment element in correspondence of the delivery end of the parallel conveyors and to push them through an arcuate guide channel which leads to the transversal conveyor.

4,215,775
ROLLER CONVEYOR FOR CONVEYING AND PRESSURE-FREE ACCUMULATION OF INDIVIDUAL ITEMS

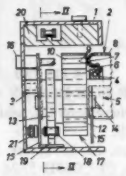
Richard Gebhardt, deceased, late of Sinsheim, Fed. Rep. of Germany, and by Elfriede Gebhardt, heiress, H. Thomastrasse 10, D-6920 Sinsheim, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,737

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650205

Int. Cl.[2] B65G *13/06*

U.S. Cl. 198—781 **13 Claims**



1. In a roller conveyor for conveying items along a conveying path and permitting such items to accumulate in a pressure-free manner, which conveyor includes supporting rollers each composed of a jacket and hub, intermediate rollers each equipped with a sprocket wheel and each arranged to drive a respective supporting roller when in a driving position, an endless drive chain engaging all of the sprocket wheels, and a rod assembly provided with a sensor extending into the conveying path of the conveyor and arranged to move a group of the intermediate rollers between their driving position and an idling position, the improvement wherein said jacket and hub of each said supporting roller together define a slide bearing via which drive power is transmitted from said hub to said jacket, each said supporting roller and its respective intermediate roller together comprise drive means defining a flattened tooth connection via which said intermediate roller drives said supporting roller, there are a plurality of groups of said intermediate rollers, each said intermediate roller being associated with a respective supporting roller, said groups being spaced along the conveying path defined by said conveyor, there are a plurality of said rod assemblies each provided with a respective sensor and each associated with a respective group of intermediate rollers, each said rod assembly comprises: an intermediate lever having one end pivotally connected to said sensor of its associated rod assembly; a connecting rod pivotally connected between the other end of said intermediate lever and said sensor of said rod assembly associated with the adjacent group of intermediate rollers located downstream along said conveying path; and rods pivotally connected to said intermediate lever at a point between its ends and provided with elongated slots via which said rods are coupled to said intermediate rollers of said associated group, each said sensor is located in the region occupied by its associated group of intermediate rollers for causing an item to stop in such region when said intermediate rollers of its associated group are moved to their idling position, and each said sensor causes its associated rod assembly to normally maintain said intermediate rollers of its associated group in their driving position.

4,215,776
BELT CONVEYOR IDLER

Thomas C. Esler, New Philadelphia, Ohio, assignor to Joseph M. Stofan, Dover, Ohio, a part interest

Filed Nov. 10, 1977, Ser. No. 850,217

Int. Cl.[2] B65G *15/08, 15/60*

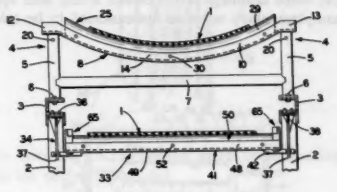
U.S. Cl. 198—823 **12 Claims**

1. Idler construction for slidably supporting a conveyor belt including:

(a) rigid channel means adapted to extend transversely across the path of a conveyor belt, said channel means having walls forming a slot therebetween;

(b) bracket means supporting the channel means in a fixed nonrotatable position;

(c) a strip of a low-friction rigid material firmly seated within the slot of the channel means and extending generally throughout the length of said channel means;



(d) said strip having a top surface projecting above the walls of the channel means to slidably engage and support a conveyor belt; and

(e) fastening means removably seating the strip of low-friction material in the slot of the channel means.

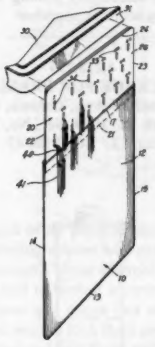
4,215,777
SUTURE HOLDING CASE

Ola D. Strickland, 3479 Cove Ter., Douglasville, Ga. 30135

Filed Apr. 9, 1979, Ser. No. 28,231

Int. Cl.[2] A61L *17/02*; B65D *85/24*

U.S. Cl. 206—63.3 **15 Claims**



1. A suture holding case comprising a panel provided with a plurality of holes therethrough for receiving therethrough and removably securing therein the intermediate portions of sutures with the end portions of such sutures hanging on opposite sides of said panel, fastening means above said holes for securing said panel to an instrument table and a bag suspended from said panel for receiving and confining the inner end portions of said sutures.

4,215,778
INFLATABLE INSTRUMENT CASE

Michael Kovins, 109 Stonhurst La., Dix Hills, N.Y. 11746

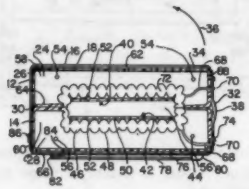
Filed May 29, 1979, Ser. No. 42,772

Int. Cl.[2] A45C *11/00*; B65D *81/02, 85/30, 85/54*

U.S. Cl. 206—314 **9 Claims**

1. An inflatable instrument case for musical instruments or the like comprising upper and lower complementary sections each including a plurality of inflatable elements, each of said plurality of inflatable elements having a pair of opposed sides and uppermost and lowermost surface, each of said plurality of

inflatable elements fixedly secured on at least one of said opposed sides of an adjacent inflatable element, said opposed ends of each of said inflatable elements being proximate to the second ends of an adjacent inflatable element when said opposed sides thereof are secured together, said uppermost surfaces of each of said plurality of said inflatable elements providing a recessed area, said recessed areas forming an open-ended chamber in said upper section and an open-ended chamber in said lower section, said recessed areas bounded by a pair of flexible webs defining said recessed areas, said upper and lower complementary sections dimensioned to be selectively



disposed in an overlaying relationship with the uppermost surfaces thereof disposed in a touching relationship, said open-ended chambers forming an enclosed storage chamber, means for communicating air to each of said plurality of inflatable elements of both said upper and said lower complementary sections, means for communicating air to said pair of flexible webs whereby said pair of flexible webs may be inflated and whereby said pair of flexible webs is contained totally within the interior of said upper and said lower complementary sections, and means for selectively joining said upper and said lower complementary sections together.

4,215,779

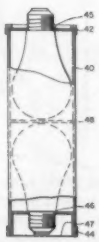
TUBULAR PACKAGE FOR FRAGILE OBJECTS

Leslie Vajtay, 107 Stanford Ave., Colonia, N.J. 07067

Filed Feb. 26, 1979, Ser. No. 15,101

Int. Cl.[3] B65D *85/42*

U.S. Cl. 206—421 **3 Claims**



1. A tubular package containing a pair of light bulbs or the like, comprising:

a tubular section formed from a thermoplastic sheet material and having a cross-sectional dimension substantially equal to that of each of said pair of light bulbs, said light bulbs being axially aligned and placed end to end within said tubular section such that respective electrical sockets of said light bulbs are pointed in opposite directions;

a spacer cushion having the same cross-sectional dimension and shape as said tubular section placed between said light bulbs and in intimate contact therewith in a plane perpendicular to the longitudinal axis of said tubular section to prevent said light bulbs from contacting each other;

a pair of centrally apertured end caps, one at the rim of each end of said tubular section;

each said end cap having an annular cross-section in a plane perpendicular to the longitudinal axis of said tubular section, the outer periphery of said end caps being joined to respective rims of said tubular section, the inner periphery of said end caps contoured for frictionally engaging said light bulbs substantially at the juncture between the electrical socket and the remaining portion of said light bulbs such that said electrical sockets protrude through said end caps and extend outwardly beyond the rims of said tubular section to permit electrical testing.

4,215,780

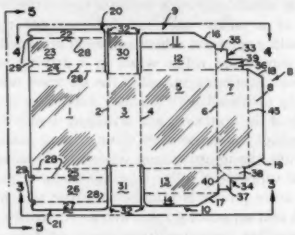
CONTAINER FOR BOOKS AND ARTICLES

Frank A. Carlson, Bridgeview, Ill., assignor to Alton Box Board Company, Alton, Ill.

Filed Nov. 17, 1978, Ser. No. 961,659

Int. Cl.[2] B65D *5/24, 85/54*

U.S. Cl. 206—424 **12 Claims**



1. A container for books and articles of like shape comprising a sheet of foldable board having top, bottom, first and second side panels, and closure panels foldably connected to form and article-encompasing sleeve of length greater than the article, said bottom panel having opposite end flaps for forming end cells extending approximately the width thereof, each end cell formed having three subpanels that extend for erection inwardly of the ends of the top and bottom panels for forming said air cells thereat, end wall panels foldably connecting with each end of the top panel, and said end wall panels disposed for providing closure for the formed end cells at each end of the container, the improvement which comprises, a reinforcing means foldably secured to each end of each side panel, the configuration of the reinforcing means of the first of said side panels being distinctively dissimilar to the configuration of the reinforcing means of the second of said side panels, and said means disposed for arrangement within their proximate formed end cells at each end thereof to provide for cell reinforcement and to enhance the top-to-bottom panel compressive strength of the container at each of its ends, the reinforcing means connecting at the ends of first side panel comprising reinforcing flaps, with a reinforcing flap connecting with each end of the said first side panel and extending for a distance across the length of and into a formed end cell, the reinforcing means connecting with the ends of the second side panel comprising a pair of tabs, one tab of each pair foldably connecting with the end edge of the said second side panel, the other tab of each pair foldably connecting with the approximate side edge of the said end wall panel, and each of said pair of tabs being foldably connected together along a fold line and to provide for their collapsing into the bellows form for locating within the formed end cell and enhancing its reinforcement after folding of the container into its usable configuration.

4,215,781

ARTICLE CARRIER WITH GUSSET RETAINERS

Richard L. Humphries, Sunnyvale, and Hans Eide, Foster City, both of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Mar. 27, 1979, Ser. No. 24,457
Int. Cl.[2] B65D *5/02, 75/06, 85/62*
U.S. Cl. 206—434 5 Claims

1. In an article carrier of the type formed from a single sheet of foldable material and having a top panel, a pair of side panels, and a bottom panel and wherein said panels are separated by fold lines, the improvement comprising:

gusset means, formed adjacent said fold lines separating said side and bottom panels, for retaining a plurality of articles disposed within said carrier, each said gusset means comprising:

first, second and third adjacent triangular gusset sections separated from each other and said bottom and side panels by fold lines;

said first section formed on said side panel adjacent said fold line separating said side and bottom panels;

said second section formed on said bottom panel adjacent said fold line separating said side and bottom panels and adjoining said first section;

the edges of said side panels and the outer edges of said first and second gusset sections forming substantially a straight line when said carrier is unerected to conserve the use of said foldable material;

said third section formed on said bottom panel and adjoining said second section;

said article carrier being characterized in that when said third gusset section is folded 180° along said fold line separating said third section from said bottom panel so as to lie on top of said bottom panel within said article carrier, and said second gusset section is folded on top of said third section, said first gusset section is automatically erected to act as a retainer for articles contained within said carrier.

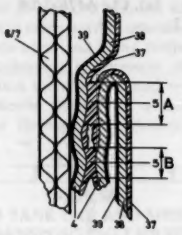
4,215,782

NON-RETURNABLE CONTAINER, COMPRISING AT LEAST TWO DISH-SHAPED PARTS JOINED TOGETHER

Werner Festag; Hans-Ueli Müller; Oldrich Stanek, all of Schaffhausen, and Peter Bühler, Seltisberg, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis and Ciba-Geigy Ltd., Basel, both of, Switzerland

Filed Nov. 24, 1978, Ser. No. 963,416
Claims priority, application Switzerland, Nov. 29, 1977, 14580/77
Int. Cl.[3] B65D *41/00*
U.S. Cl. 206—525 14 Claims

1. A non-returnable container made from at least two dish-shaped parts which have outward facing flanges joined together by a sealed seam, said container being useful in particular for holding liquid, pasty, granular or powdery substances, wherein the dish-shaped parts are made from a metal-plastic composite and in which the said flanges are joined together by means of at least one sealed seam and are held in a bent position by means of a holding device but are not permanently deformed, wherein said holding device is sufficiently rigid to be able to keep said flanges in a bent position as a result of which



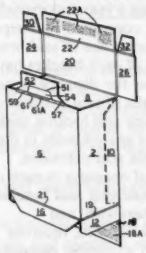
excessive stressing of the sealed seam or separating forces acting on the seam are avoided.

4,215,783

CARTON WITH RECLOSURE FEATURE

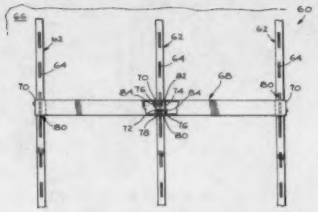
Thomas VanderLugt, Jr., Kalamazoo, Mich., assignor to Brown Company, Kalamazoo, Mich.

Filed Jun. 18, 1979, Ser. No. 49,952
Int. Cl.[2] B65D *17/24*
U.S. Cl. 206—626 6 Claims



1. A carton formed of an integral blank comprising a container assembly including a front wall panel, a rear wall panel, and side wall panels, and a cover assembly hingedly connected to said rear wall panel including a cover top panel having a cover front wall panel and cover end wall panels connected thereto, and first and second lock flaps positioned between said cover front wall panel and said front wall panel, said first lock flap being affixed to the inner surface of said cover front wall panel and said second lock flap being hingedly connected to the upper edge of and folded over into juxtaposition with the outer surface of said front wall panel, said second lock flap being articulated to the upper edge of said front wall panel and being located centrally thereof, said first lock flap comprising a central body portion and webs outwardly disposed with respect to said second lock flap, said first lock flap surrounding said second lock flap and the said webs of said first lock flap being detachably connected by lines of severance to the upper edge of said front wall panel at their ends, the edges of said second lock flap being surrounded by and in substantially abutting mutual engagement with but free of attachment to the corresponding edges of said first lock flap on all sides of said second lock flap except the side hingedly connected to the upper edge of said front wall panel whereby, upon opening and reclosing of said carton, said lock flaps cooperate to retain said cover in closed position by substantially abutting mutual engagement of the surrounding edges of said first lock flap with the corresponding free edges of said second lock flap.

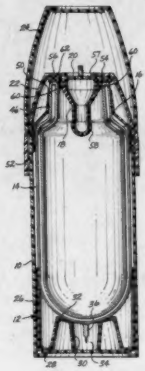
4,215,784
WALL BRACKET ASSEMBLY
Patrick W. Perkins, 8015 Wentworth St., Sunland, Calif. 91040
Filed Jan. 22, 1979, Ser. No. 5,007
Int. Cl.[2] A47F *5/08*
U.S. Cl. 211—105.2 **8 Claims**



1. An improved wall bracket assembly, said assembly comprising, in combination:
   a. a plurality of spaced generally parallel locator strips, each strip having spaced bracket-receiving means disposed along the length thereof;
   b. a cross support spanning said strips and having a plurality of bracket-receiving hollow rear extensions, each said extension being disposed adjacent a separate one of said strips and including a pair of spaced side walls;
   c. a plurality of brackets, the front end of each said bracket being releasably disposed in a different one of said extensions and having a rear end extending rearwardly thereof and releasably connected to a separate one of said strips through a separate one of said bracket-receiving means;
   d. said front end of each bracket having a thickness significantly less than the distance between the inside of said spaced side walls of said extensions; and
   e. bracket-adjusting and locking means comprising:
      (i) a plurality of spaced holes in the front end of each said bracket within said extension,
      (ii) a plurality of openings in each of said sidewalls of said extensions matching said bracket holes and adapted to be aligned therewith, and
      (iii) a plurality of bolts received through said sidewall openings and adjustable engaging said bracket through said bracket holes, whereby the spacing of said front end of each said bracket within said extension and thereby the alignment of each said bracket with each said strip is readily adjustable and lockable by manipulation of said bolts.

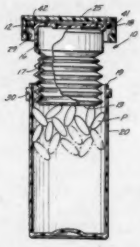
4,215,785
BABY FEEDING BOTTLE
Josef Schwaiger, 902 NE. 115th, Seattle, Wash. 98125
Filed Mar. 22, 1979, Ser. No. 22,730
Int. Cl.[2] A61J *9/00*; **A47K** *41/02*
U.S. Cl. 215—11 C **5 Claims**

1. In a baby feeding bottle of a type comprising a vacuum-wall receptacle having a body portion and a frusto-conical neck portion defining a mouth and including an annular end surface surrounding said mouth; a housing for said vacuum-wall receptacle comprising a lower part in which the body portion of the vacuum-wall receptacle is received, said lower part including an open upper end beyond which the neck portion of said vacuum-wall receptacle extends, and an annular upper part having a base end which is detachably connected to the lower part of said housing; a nipple including a base flange which during use is seated on the annular end surface of the vacuum-wall insert, and an upstanding nursing portion; and a cup-like nipple retaining member which surrounds the upper part of said housing and includes a lower end which is connected to the lower part of said housing, and an upper end which includes a central opening through which the nursing portion of the nipple projects and an annular upper end wall which extends about said opening and makes clamping contact with the base flange of said nipple, the improvement characterized by said upper part of the housing being constructed from a light weight, durable, washable plastic material of a type that will not absorb dirt or odors, and comprising a frusto-conical neck portion which surrounds the neck portion of the vacuum-wall receptacle and includes a frusto-conical inner surface which extends at a slope which is greater than the slope of the



outer surface of the frusto-conical neck portion of the vacuum-wall receptacle, said neck portion tapering upwardly and terminating in a thin circular lip which makes a line contact with the neck portion of the vacuum-wall receptacle at a side location closely below said annular end surface, and wherein the neck portion of the upper part of said housing is relatively thin-walled and is distortable so that it can change shape if necessary to in that manner accommodate manufacturing differences in the vacuum-wall receptacle.

4,215,786
CONTAINER CAP HAVING MEANS TO PROTECT ARTICLES
Michael A. Vertes, 20 Tubbs Spring Ct., Weston, Conn. 06883
Filed Nov. 1, 1978, Ser. No. 956,504
Int. Cl.[3] B65D *51/26*
U.S. Cl. 215—231 **13 Claims**



1. A container cap comprising a bellows and flange means extending radially outwardly therefrom, and an overcap operatively associated therewith, said flange means comprising means to engage the lip of a container so that the bellows is disposed within the container, whereby the bellows expends to contact the material within the container to limit movement thereof, further comprising a hollow cylindrical portion integrally connected at one end to the bellows and at the other end to the flange means, said flange means further comprising means to engage said overcap, said overcap comprising means

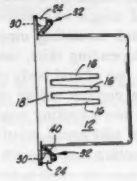
for engaging the outside of the container so as to compress said flange between said overcap and said container lip to form an air-tight seal.

4,215,787

ELECTRICAL WALL BOX

Thomas F. Moran, Jr., Aurora, Ohio, and Ivan L. Volgyesy, Camanche, Iowa, assignors to Indian Head Inc., New York, N.Y.

Filed Nov. 29, 1974, Ser. No. 528,007
Int. Cl.³ H02G *3/08*
U.S. Cl. 220—3.6 **18 Claims**



1. An electrical wall box comprising:
a plurality of walls defining a hollow enclosure having an open side;
a pair of slotted lugs adjacent the open side of the enclosure and disposed on opposite sides thereof, and each having a passageway extending therethrough for receiving a fastening element; and
generally V-shaped spring metal inserts each having a first leg pressed into the slot of a respective one of said lugs, and each including a second leg bent through an angle of more than ninety degrees with respect to said first leg to impart the V-shape to said spring metal insert, the second leg of each of the metal inserts extending at an acute angle to the axis of the passageway through the respective lug into which the respective insert is pressed, said second leg surrounding an aperture formed therethrough in alignment with the passageway through the respective lug into which the respective insert is pressed, with the aperture in the leg positioned on the axis of the passageway for receiving a threaded fastener extended through the aperture and along the axis of the passageway.

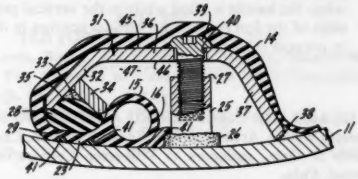
17. Means for joining a cover plate to a housing comprising:
A. a plurality of screws;
B. a plurality of clearance holes formed through said cover plate for receiving said screws;
C. a plurality of bosses disposed at the periphery of said housing registering with said cover plate clearance holes and having clearance bores formed therethrough for receiving said screws, each of said bosses including
1. an edge surface substantially parallel to the axis of said clearance bores;
2. a substantially flat top flange surface adjacent said plate;
3. an inclined bottom surface forming an acute included angle with said edge, and
4. a substantially rectangular slot extending upwardly from said bottom surface parallel to the axis of said clearance bore and spaced between said clearance bore and said edge,
D. a plurality of generally V-shaped resilient clips engaging said bosses each of said clips comprising:
1. a straight side portion adapted to insertably engage said slot and having formed thereon a spring tab exerting a force normal to the axis of said slot, and
2. a bottom locking position resiliently extending from said side portion and having an aperture sized to accept said screw formed therethrough having a relaxed position wherein said locking portion is disposed in an angular relationship relative to the axis of the clearance bore such that the axis of said aperture describes an acute angle with the axis of the clearance bore; and movable in response to the insertion of said screw through said clearance bore to operatively engage said locking portion thereby allowing the ratcheting passage of said screw to a loaded position wherein the axis of said aperture is more nearly coincident with the axis of said clearance bore, and being further movable in response to tightening engagement of the screw to a locked position intermediate said relaxed and loaded positions wherein the surface of the locking portion adjacent the through bore threadedly engaged the screw.

4,215,788

RAILROAD TANK CAR AND METHOD FOR TRANSPORTING LIQUIDS

James D. Parsons, Munster, Ind., assignor to Union Tank Car Company, Lincolnshire, Ill.

Filed Aug. 10, 1978, Ser. No. 932,818
Int. Cl.² B65D *25/06*
U.S. Cl. 220—22 **20 Claims**



1. A container for a fluid material comprising:
A. a wall enclosing such material;
B. a flexible diaphragm in said container, said diaphragm having an enlarged bead around its entire periphery, said bead and the adjacent area of said diaphragm contacting said wall; and
C. means for sealing said diaphragm against said wall comprising:
1. a plurality of first fastener elements secured to said wall at spaced intervals, said elements essentially lying in a plane passing through said enclosure;
2. a clamp having one end compressing said adjacent area of said diaphragm, said clamp extending over said bead and said first fastener elements and having an opposite end which contacts but is unattached to said wall; and
3. second fastener elements mating with said first fastener elements for adjustably holding said clamp in compressing engagement with said adjacent area.

4,215,789

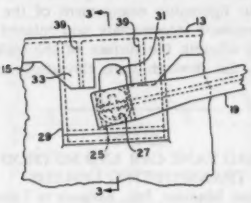
BASKET WITH SELF-LOCKING HANDLE

William Pfeifer, Springdale, Pa., assignor to Armstrong Store Fixture Corporation, Pittsburgh, Pa.

Filed Jun. 15, 1979, Ser. No. 48,844
Int. Cl.² B65D *25/28, 25/32*
U.S. Cl. 220—96 **3 Claims**

1. In combination, a basket and a U-shaped handle straddling the basket which can be locked into a vertical position by lifting up on the handle and which automatically unlocks and rotates to a stowed position when released:
said basket having side walls forming an upper edge thereof and a rim extending laterally outward from the upper edge of each side wall and terminating in a downwardly directed flange spaced from and outside of each side wall, each of said flanges having a vertical notch extending upward into the flange from the downwardly directed free edge thereof, and said side walls of the basket each defining a closed-end vertical slot horizontally aligned with the vertical notch in the opposed flange, said U-

shaped handle comprising two parallel legs depending from opposite ends of a hand grasping base portion, the free ends of the legs terminating in opposed, inwardly directed feet, each of which is provided with a neck portion spaced from the associated leg, said neck being slidably and rotatably received in the vertical slot in the side



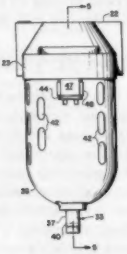
of the basket, and said slots being of such a length that with the necks of the feet on the handle located at the bottom of the slots the handle can be rotated between a generally horizontal and a vertical position and such that when the handle is lifted while in the vertical position, the sides of the feet engage the vertical notches in the flanges to prevent rotation of the handle.

4,215,790

GUARD FOR COMPRESSED AIR FITTING BOWL

Franklin Ribble, Arvada, and G. Kenneth Russell, Castle Rock, both of Colo., assignors to Wilkerson Corporation, Englewood, Colo.

Filed May 14, 1979, Ser. No. 38,664
Int. Cl.[2] B65D *41/06*; B01D *31/00*
U.S. Cl. 220—240 **2 Claims**



1. A compressed air fitting device, comprising in combination:

a header having an inlet and an outlet for compressed air, and including a depending skirt defining a bowl receiving opening intermediate said inlet and outlet;

a transparent bowl having an open end adapted to be received in said bowl receiving opening in said header, said bowl further having a domed end having a bore therethrough;

a drain valve retained within the bore of the domed end of said bowl for draining the interior contents of the bowl;

an O-ring seal in said depending skirt for sealably engaging the open end of said bowl;

an impact resistant metal bowl guard conformably fitting said bowl in exterior surrounding protective relationship therewith, said guard having a plurality of observation openings therein for observing the contents of the bowl to be monitored and selectively drained through the drain valve, said bowl guard further having at the domed end thereof an aperture through which said drain valve protrudes;

a plurality of inwardly directed body ribs alternating with locking notches arrayed about the inward circumference of said bowl receiving opening in said header;

mounting nipples circumferentially spaced around the open end of said guard adapted to be interspersed between said body ribs through said locking notches, said mounting nipples being integrally formed adjacent the open end of said metal bowl guard;

a nipple track vertically adjacent to said locking notches and body ribs of said depending skirt providing for rotation of said nipples of said guard within said track to a position wherein said nipples are vertically adjacent to said body ribs for retaining said guard in engagement with said skirt; and

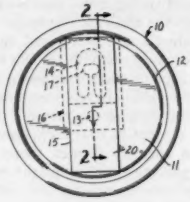
a locking pin tongue biased by a locking pin spring, affixed to said guard, said tongue so positioned that upon engagement of said guard mounting nipples into said locking notches of said depending skirt, said tongue is biased by interference with one of said body ribs, and upon rotation of said mounting nipples within said nipple track said tongue protrudes into a locking notch thereby preventing further rotation of said guard relative to said header and aligning said mounting nipples with said body ribs.

4,215,791

EASY OPEN CLOSURE SYSTEM

Wilfred R. Brochman, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 6, 1979, Ser. No. 63,756
Int. Cl.[2] B65D *51/22*
U.S. Cl. 220—258 **14 Claims**



1. An end portion for a container, said end portion having at least one preformed opening and an easy open closure system for said opening, said easy open closure system comprising:

a. an interior sheet material which covers the underside of said opening and which is firmly adhered to the bottom of said end portion circumjacent said opening, said interior sheet comprising

i. a backing member of about 15 to 100 micrometers in thickness and having a ppt value in the range of about 15 to 200 grams/ply;

ii. a layer of adhesive having a thickness of about 3 to 100 micrometers, firmly adhering said backing member to said end portion;

b. an exterior flexible film circumjacent said opening, said flexible film at least 6.3 mm in width and about 25–250 micrometers in thickness which neither breaks nor elongates more than 25% under a tension of 4 pounds (1.8 kg) and which is capable of being pulled back upon itself without rupturing, wherein said flexible film is essentially free of adhesive and is bonded to said interior sheet material in the area of said opening by means of said layer of adhesive of said interior sheet material;

wherein said means of adhesive attachment will withstand a force of up to 22 pounds per inch width (3.9 kg per cm width) of said exterior flexible film at temperatures from at least 35° F. to 100° F. (2° to 38° C.) without separation of said flexible film from said interior sheet material and wherein at least one of

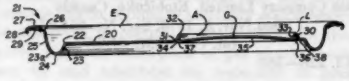
said flexible film and said interior sheet material is moisture impervious.

4,215,792

PUSH-DOWN GATE IN A RAISED APERTURE IN A CAN END

Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020

Filed Aug. 6, 1979, Ser. No. 63,793
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—268 **10 Claims**



1. A push-down gate in a panel section of a can end, below an aperture therein and being connected to the panel at the aperture by a hinge means wherein:

(a) said aperture comprises a short, inwardly-inclined lip upstanding from the end panel section, having an outer wall portion upfolded from the end panel, an inner wall portion forming the aperture orifice and a reverse fold at the crest of the lip interconnecting the inner and outer wall portions;

(b) an inward fold about the base of the inner wall portion forms a gate panel below the aperture, said inward fold being on a short radius and being adjacent to the upfold radius from the end panel to the outer wall portion; and

(c) a score cut in the gate panel at the inward fold extending about the panel from each side of the hinge means defines the push-down gate.

4,215,793

ANTI-SPILL LID

George Packard, 14227 SW. 275 St., Naranja Lakes, Fla. 33032

Filed Nov. 29, 1978, Ser. No. 964,493
Int. Cl.[2] B65D *41/48*
U.S. Cl. 220—270 **3 Claims**

1. A spill-inhibiting closure lid for use with full or nearly full open ended potable containers, said lid having means for releasable engagement with the container about its periphery, said lid having a removable, wedge-shaped drinking section defined by a pair of intersecting perforation lines, and tab means for removing said wedge-shaped drinking section when potable consumption is desired; the improvement comprising,

- slanted perforations formed at an acute angle with respect to the top surface of the lid surrounding the wedge-shaped section in said lid defining said removable wedge-shaped drinking section,
- said slanted perforations extending through said lid so that removal of said drinking section exposes a pair of inclined baffle walls,
- each of said inclined baffle walls defining an overhang relative to the surface of the potable so that potable waves impinging thereon are quelled,
- and a weakening line bisecting said wedge-shaped drinking section so that the wedge-shaped portion of said lid folds inwardly when said tab means is pulled thereby facilitating the removal of said drinking section.

2. A spill-inhibiting closure lid for use with full or nearly full open ended potable containers, said lid having means for releasable engagement with the container about its periphery, said lid having a removable wedge-shaped drinking section defined by a pair of intersecting perforation lines, and tab means for removing said wedgeshaped drinking section when potable consumption is desired; the improvement comprising,

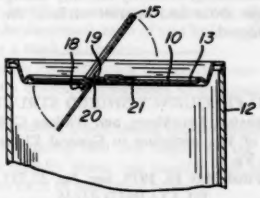
- a pair of intersecting weakening lines in spaced-apart substantially parallel relationship with said perforation lines,
- said weakening lines disposed outwardly of said perforation lines so that pulling said tab means separates said drinking section from said lid along said perforation lines and causes a portion of said lid to fold upwardly along said weakening lines,
- said portion of said upwardly folded lid defining a pair of opposed, inclined baffle walls,
- each of said inclined baffle walls defining an overhang relative to the surface of the potable so that potable waves impinging thereon are quelled.

4,215,794

TAB FOR EASY-OPEN CAN END

Leon L. Lewis, Butler, and Michael V. Murray, Monroeville, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jun. 29, 1979, Ser. No. 53,623
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—270 **4 Claims**



1. In an easy-open can end which carries a tab for punching a portion of the can end inwardly to open the can, the improvement in which said tab has an anodic insert to prevent corrosion of the can end or tab.

4,215,795

END STRUCTURE FOR A CAN BODY AND METHOD OF MAKING SAME

William F. Elser, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 836,461, Sep. 26, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,846
Int. Cl.[2] B21D *51/44*; B65D *41/42*
U.S. Cl. 220—276 **2 Claims**

1. A container closure with a central panel having a selectively weakened fracturable path means for facilitating removal of a central panel in response to a force exerted against such fracturable path means, said closure comprising:

an annular outer rim;

an annular flat section extending inwardly from said annular rim and joined thereto by an intermediate radius portion;

a central panel; and

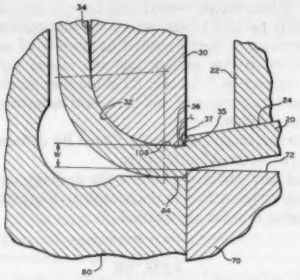
a weakened path of reduced thickness joining said flat section and said central panel wherein the circumferential edge portion of said central panel defines an upwardly extending, outwardly laterally facing marginal edge and the inner portion of said annular flat section defines a downwardly extending, inwardly laterally facing mar-

ginal edge, the edges being substantially normal to the plane of the closure and being axially aligned.

2. A method of forming an end closure for a composite can comprising the steps of:

providing a blank of sheet material;

forming said blank in a single die operation including contouring said blank and producing a circumferential central panel surrounded by a circumferential rim and an annular weakening line separating said central panel and said rim,



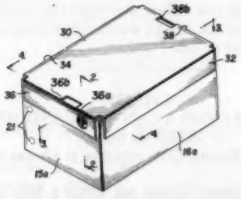
said annular weakening line being formed in said blank by causing exterior and interior surfaces of said blank to be offset in a direction normal to the plane of said closure to simultaneously form an upwardly extending, outwardly laterally facing annular marginal edge about the periphery of said central panel of said exterior surface and a downwardly extending, inwardly laterally facing annular marginal edge about said interior surface, the edges being axially aligned.

4,215,796

RADIO FREQUENCY SHIELD STRUCTURE

Robert A. Johnston, Lynchburg, and Wallace G. Keesee, Rustburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed May 10, 1979, Ser. No. 37,737
Int. Cl.[2] B65D *41/16*
U.S. Cl. 220—306 **10 Claims**



1. A radio frequency shielding container, comprising:

a. intersecting front, rear and opposed side walls;

b. a cover member adapted to form a removable cover for the container formed by said walls;

c. resilient latch means on at least one of said walls or on said cover member;

d. latching receiving means on the other of said one wall or said cover member for engaging with said latch means for releasably securing said cover member on the container;

e. said latch means comprising a resilient tongue-like member that extends parallel to the surface of said one wall, that is resiliently biased in the direction of engagement with said latch receiving means, and that terminates in an outwardly directed retaining member which is substantially perpendicular to said one wall;

f. and wherein said latch receiving means comprise an opening formed at a location which will permit engagement with said retaining member of said resilient tongue-like member;

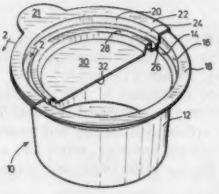
g. whereby said latch means can be disengaged from said latch receiving means by manually moving said latch means in a direction opposite to said direction of engagement.

4,215,797

PLASTIC CONTAINERS AND LIDS THEREFOR

Alex C. Chen, Mississauga, Canada, assignor to Consumers Glass Company Limited, Etobicoke, Canada

Filed Nov. 8, 1978, Ser. No. 958,931
Int. Cl.[2] B65D *41/00*
U.S. Cl. 220—359 **9 Claims**



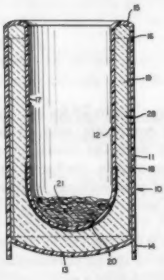
1. Reusable plastic container in combination with reusable plastic lid, said lid being hermetically sealed to said container by a set hot-melt thermoplastic adhesive between opposing surfaces of cooperating lid and container rim, a layer of said adhesive having been applied to said container rim prior to said lid having been heat-sealed to said container rim, said thermoplastic adhesive when set having a greater affinity for the lid plastic material than for the container plastic material, such affinity being sufficient to ensure that on removing said lid from container, such thermoplastic adhesive is peeled from the container rim and thereby removed with the reusable lid.

4,215,798

CONTAINER FOR CRYOGENIC LIQUID

Michael F. Patterson, Clarence Center, and Arun Acharya, East Amherst, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 15, 1979, Ser. No. 3,602
Int. Cl.[2] B65D *25/18*; F17C *3/02, 13/00*
U.S. Cl. 220—421 **14 Claims**



1. A double-walled container for storage and dispensing of cryogenic liquid comprising:

spaced-apart inner and outer wall members enclosing an insulation space, said inner wall member being free of openings communicating with said insulation space and having an inner surface forming a receptacle for said cryogenic liquid, with said wall members being entirely

formed of a polymeric thermoplastic material selected from the group consisting of polyethylene, polypropylene, polytetrafluoroethylene and polychlortrifluoroethylene, said inner member being uncoated with any permeation barrier coatings, said polymeric thermoplastic wall members being permeable to gas flow between an exterior environment of said container and said insulation space; and

a mass of adsorbent disposed in said insulation space in thermal contact with said inner wall member, said container characterized whereby:

(1) introduction of cryogenic liquid into said container receptacle effects cooling of said inner wall member and said adsorbent in thermal contact therewith thereby causing increased adsorption of gas in said insulation space by said adsorbent for reduction of pressure therein and enhancement of the insulation quality of said insulation space, and

(2) complete removal of cryogenic liquid from said container receptacle effects warming of said inner wall member and adsorbent in thermal contact therewith, thereby causing desorption of gas from said adsorbent in said insulation space to raise pressure therein and cause pressure in said insulation space above pressure of said exterior environment of said container to be at least partially relieved by flow of gas through said polymeric thermoplastic wall members from said insulation space to said exterior environment,

wherein the ratio of mass of said adsorbent, in grams, to volume of said insulation space, in cubic centimeters, is from 0.005 to 0.150.

9. A method of fabricating a double-walled container for storage and dispensing of cryogenic liquid, comprising the steps of:

(a) providing a smaller inner wall member and a larger outer wall member in spaced relationship to one another to form an insulation space therebetween, said inner wall member being free of openings communicating with said insulation space and having an inner surface forming a receptacle for said cryogenic liquid and said wall members being entirely formed of polymeric thermoplastic material selected from the group consisting of polyethylene, polypropylene, polytetrafluoroethylene and polychlortrifluoroethylene, said inner member being uncoated with any permeation barrier coatings, said polymeric thermoplastic wall members being permeable to gas flow between an exterior environment of said container and said insulation space;

(b) placing a mass of adsorbent in said insulation space in thermal contact with said inner wall member; and

(c) enclosing said insulation space with said inner and outer wall members under atmospheric conditions to form said container having said inner and outer wall members bounding the insulation space containing gas at atmospheric pressure, and said container characterized whereby in subsequent use

(1) introduction of cryogenic liquid into said container receptacle effects cooling of said inner wall member and said adsorbent in thermal contact therewith, thereby causing increased adsorption of gas in said insulation space by said adsorbent for reduction of pressure therein and enhancement of the insulation quality of said insulation space and

(2) complete removal of cryogenic liquid from said container receptacle effects warming of said inner wall member and adsorbent in thermal contact therewith, thereby causing desorption of gas from said adsorbent in said insulation space to raise pressure therein and cause pressure in said insulation space above pressure of an exterior environment of said container to be at least partially relieved by flow of gas through said polymeric thermoplastic wall members from said insulation space to said exterior environment,

and wherein the adsorbent is provided in said insulation space in an amount such that the ratio of mass of said adsorbent, in grams, to volume of said insulation space, in cubic centimeters, is from 0.005 to 0.150.

4,215,799

DISC DISPENSER

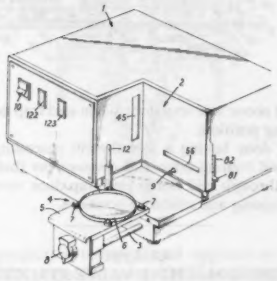
Derwent Swaine, Winchester, England, assignor to Oxoid Limited, Hampshire, England

Filed Jul. 18, 1978, Ser. No. 925,954

Claims priority, application United Kingdom, Jul. 22, 1977, 30934/77

Int. Cl.[2] **B65H** *3/44;* **B65G** *59/06*

U.S. Cl. 221—93 **15 Claims**



1. A dispenser for a stack of flat objects to be dispensed, said dispenser comprising:

an auxiliary housing containing a plurality of holders for objects to be dispensed, each of said holders being capable of holding a stack of objects;

a moving means for each stack for moving one object from the end of a corresponding stack to a respective pick-up position;

a plurality of transfer pipes having suction means connected thereto for holding said one object on the end of said respective transfer pipes, one transfer pipe being located adjacent to each of said stack holders;

a support plate for slidingly supporting said transfer pipes;

support plate moving means connected to said supporting plate for moving said support plate from said pick-up position to a second releasing position; and

suction terminating means connected to said suction means for terminating said suction being applied to said pipes for releasing said object when said pipes are moved into said releasing position.

4,215,800

VENDING MACHINE OR THE LIKE WITH IMPROVED TRAP DOOR TYPE DISPENSING MECHANISM

Robert J. Collins, Venice; Richard R. Stutsman, Mount Baldy, and Theodore C. Youngkin, North Hollywood, all of Calif., assignors to Rod Pierce & Associates, Marina del Rey, Calif.

Continuation-in-part of Ser. No. 762,113, Jan. 24, 1977, Pat. No. 4,134,520, and Ser. No. 914,560, Jun. 8, 1978. This application Sep. 19, 1978, Ser. No. 943,729

Int. Cl.[2] **B65G** *35/04*

U.S. Cl. 221—129 **28 Claims**

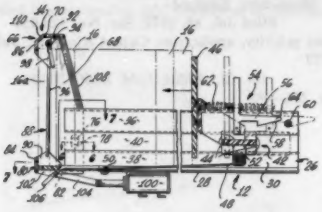
1. In a vending machine having at least one module in which articles to be vended are stored and means for moving said articles toward a front end of said module, a dispensing mechanism disposed at said front end to receive a lead one of said articles to be vended, said dispensing mechanism comprising:

a trap door movable between a retaining position forming an extension of said module in which said article is supported thereby and a downwardly inclined releasing position in which said article is released;

a hinge by which said trap door is pivotably connected to

said module along a trailing edge thereof for movement between said retaining and releasing positions; and

at least one finger having an inclined guide surface that extends downwardly from said module and is disposed so that said guide surface is located beneath said trap door when said trap door is in said retaining position and is



located above said trap door when said trap door is in said releasing position;

said trap door having a slot therein extending forwardly from said trailing edge and disposed so that said finger passes through said slot as said trap door moves between said retaining and releasing positions.

4,215,801

VENDING MACHINE VALVE STRUCTURE

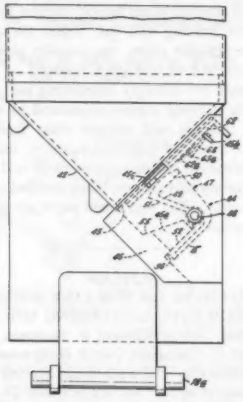
Alec T. Newman, and Davič Rhodes, both of Banbury, England, assignors to General Foods Limited, Banbury, United Kingdom

Filed Nov. 23, 1977, Ser. No. 854,243

Claims priority, application United Kingdom, Dec. 1, 1976, 50171/76

Int. Cl.[2] B67D 5/44

U.S. Cl. 222—63 **19 Claims**



1. A valve for controlling the dispensing of granular friable material from a hopper comprising: means defining a passageway for the material; a valve member having two angularly spaced valve elements; means for pivotably mounting the valve member on the means defining a passageway on one side of the passageway about an axis extending transversely to the passageway such that the two valve elements are spaced about the pivotal axis of the valve member; means for varying the cross-sectional area of the passageway upstream of the path of travel of the upstream element; and means defining a pair of oppositely facing valve seats spaced along the passageway; each of said seats at least partially surrounding the passageway, the upstream one of which faces upstream along the passageway and the downstream one of which faces downstream along the passageway, the elements being capable of alternately closing the passageway by engaging, in face to face relationship, a respective valve seat according to the rotational position of the valve member, so that, in use, with the downstream of the two elements closing the passageway by engaging the downstream valve seat a charge of the material in the hopper can be received between the two elements and so that when the valve member is rotated to open the passageway by the downstream element and subsequently close it by the upstream element engaging the upstream valve seat the charge of material can be dispensed, flow through the passageway being substantially obstructed by the upstream element as the valve member is returned to close the passageway by the downstream element.

4,215,802

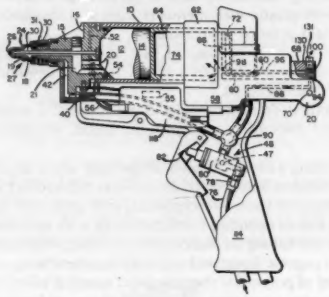
ADHESIVE GUN HAVING NEEDLE VALVE NOZZLE

Robert L. Ornsteen, Cape Neddick, Me., assignor to Ornsteen Chemicals, Inc., Seabrook, N.H.

Filed Nov. 8, 1978, Ser. No. 958,871

Int. Cl.[2] B67D 5/62

U.S. Cl. 222—146 H **14 Claims**



14. For use in a hot melt adhesive applicator, a needle valve nozzle assembly comprising:

a nozzle housing adapted for connection to a chamber containing a quantity of hot melt adhesive;

a reciprocable nozzle disposed at the discharge end of said housing and having a discharge orifice at one end for the discharge of adhesive therefrom and a second end facing said nozzle housing;

a conduit in communication between said chamber and said discharge orifice for conducting said adhesive to said discharge orifice;

a stationary needle fixedly mounted to said housing and extending through at least a portion of said conduit and into said discharge orifice, said needle being in sealing engagement with said discharge orifice when said nozzle is in a closed position;

biasing means operative to urge said nozzle into said closed position to prevent flow of adhesive through said discharge orifice;

pneumatically actuated means disposed adjacent said second end of said nozzle and adapted for urging said nozzle into an open position upon the application of pneumatic pressure thereto, said discharge orifice of said nozzle being spaced from said needle when said nozzle is in an open position;

actuating means adapted to apply pressurized operating gas to said pneumatically actuated means for opening said nozzle and to discontinue application of pressurized operating gas to said pneumatically actuated means and to vent said pneumatically actuated means to an exterior atmo-

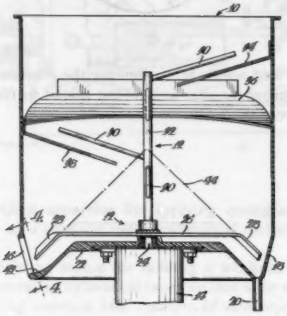
sphere to permit said biasing means to urge said nozzle into its closed position.

4,215,803

ICE HOPPER HAVING A PLURALITY OF SHELVES AND A RAMP

Albert L. Schafer, Chicago, Ill., assignor to Remcor Products Company, Franklin Park, Ill.

Filed Jul. 26, 1978, Ser. No. 928,243
Int. Cl.² B67D 5/64
U.S. Cl. 222—240 **12 Claims**



1. An ice handling apparatus, comprising a hopper for reception of a mass of small particles of ice; an impeller rotatable in said hopper for agitating the ice within said hopper; and a plurality of shelves positioned at successive rotational increments and decreasing vertical positions within said hopper on side walls thereof, each said shelf extending adjacent to said side walls along a horizontal line and extending outwardly from said side walls to less than the center of said hopper for supporting at least a portion of the mass of ice thereon, whereby the pressure of ice overlying said shelves on ice underlying said shelves and congealing or agglomeration of the underlying ice are decreased, said impeller having an axis of rotation extending between inner ends of said shelves and a plurality of ice engaging arms extending outwardly from said axis at vertically staggered positions for rotation across upper surfaces of said shelves, rotation of said impeller moving ice horizontally in said hopper and across said shelves without forcing the ice downwardly so that as the ice moves off of each of said shelf the ice is free to gravitate onto the next succeeding shelf.

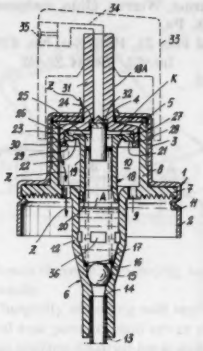
4,215,804

MANUAL CONTROL DISPENSING PUMP FOR LIQUID CONTAINERS

Giancarlo Giuffredi, Milan, Italy, assignor to Coster Tecnologie Speciali S.p.A., Milan, Italy

Filed Oct. 30, 1978, Ser. No. 956,185
Claims priority, application Italy, Nov. 17, 1977, 29764 A/77
Int. Cl.² B67D 5/42
U.S. Cl. 222—321 **6 Claims**

1. A reciprocating manual dispensing pump comprising:
a body having a single pumping cylinder section;
a suction valve at one end of said pumping cylinder section;
a hollow piston, said piston further comprising:
a smaller diameter section operating within and slidingly sealed at one end to the walls of said pumping cylinder, said smaller diameter section being of a length equal to the maximum reciprocating stroke of said pump;
a larger diameter section composed of resiliently deformable material and having upper and lower walls defining an internal chamber hydraulically connected to said smaller diameter section, said upper and lower walls being connected to one another, said lower wall being attached to said smaller diameter section at the end of said smaller diameter section opposite said slidingly sealed end;
an outlet tube extending from said upper end of said larger diameter section in the direction opposite said smaller diameter section;
a valve projection on the inner surface of said lower wall,



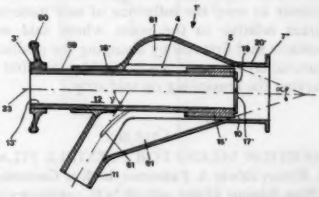
said projection being located opposite to said outlet tube, said projection being of sufficient length and diameter to close the opening to said outlet tube when the larger diameter section is undeformed, whereby said outlet is closed until internal pressure displaces said projection by deformation of said chamber; and
a spring within said pumping cylinder section, said spring providing a restoring force to said piston.

4,215,805

PROPELLING HEAD FOR THE PNEUMATIC PROPELLING OF A MULTIFILAMENT TOW

Ejvind R. Nielsen, Nr. Aby, Denmark, assignor to N.F. Udviklingscenter A/S, Copenhagen, Denmark

Filed Oct. 20, 1978, Ser. No. 953,108
Claims priority, application Denmark, Sep. 18, 1978, 4126/78
Int. Cl.² B65H 51/16
U.S. Cl. 226—97 **6 Claims**



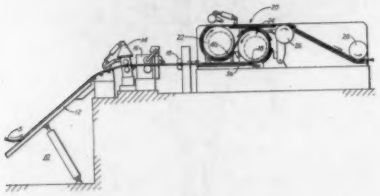
1. A propelling head for the pneumatic propelling of a multifilament tow, comprising a housing constructed with a venturi portion having a rear tow entrance end, a front tow exit end, a centrally arranged through passage for the tow, said through passage extending centrally from said rear tow entrance end to said front tow exit end, and annular chamber surrounding said through passage, said annular chamber having at least one compressed air inlet port, said annular chamber communicating with said through passage through an annular slot formed between the inner wall of said annular chamber and the outer wall of said through passage and forming said venturi portion, a member with a tow engaging hole being provided in the rear portion of said through passage to establish a closure between the tow entering the through passage and the inner wall of that

passage, characterized in that the inner wall of said annular slot is substantially cylindrical, and longitudinal guiding ribs are provided in said annular slot for guiding the flow of air through said slot into said through passage.

4,215,806
TENSION BRIDLE

James R. Holmstrom, Warren, Ohio, assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 21, 1978, Ser. No. 879,417
Int. Cl.[2] B65H *23/08*
U.S. Cl. 226—195 **12 Claims**



1. An improved strip bridle unit having means for optimizing the multiplication of tensioning on the strip of material and employed for processing continuously moving material coming to the unit under little or no externally applied tension, comprising:

a first rotatable roll,

a second rotatable roll parallel to the first roll,

means for rotatably supporting said first and said second rolls,

said rolls each having surfaces arranged in a manner so that succeeding portions of said material partially encircles said surfaces and wherein the strip first encircles said surface of said first roll,

said first roll operatively connected to a load developing means, and

material attracting means carried by at least said first roll for causing said material to continuously contact said surface of said first roll under a constant force along the width of said strip to create a tension in said material immediately prior to contacting said fist roll to cause said first roll to place an increased load on said load developing means,

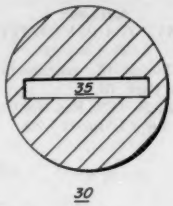
said material attracting means constructed and arranged in a manner to vary the influence of said material attracting forces relative to the point where said material first contacts said first roll by changing the positioning of said material attracting means carried by said first roll thereby varying the tensioning on said strip.

4,215,807
INSERTION MEANS FOR FLEXIBLE FILAMENTS

Don D. Ritter; Edwin A. Patterson, both of Gastonia, and Henry M. Pigg, Mount Holly, all of N.C., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Jan. 2, 1979, Ser. No. 412
Int. Cl.[3] D05B *3/20*
U.S. Cl. 227—21 **6 Claims**

1. An improved fastener insertion assembly of the type including a needle containing a slot through which a portion of a fastener attachment member may be forced and expelled, said fastener attachment member having two ends connected by a thin filament; means for telescoping said needle out of a housing along a projection axis; first and second clamping means for engaging a workpiece through which the fastener attachment member is to be inserted, said first and second clamping means being formed to admit the passage of said needle and said first clamping means being movable in the direction of said needle; and means for projecting said first clamping means along said projection axis, in which the improvement comprises second clamping means comprising a receiver member containing a cavity, said cavity being configured to allow the

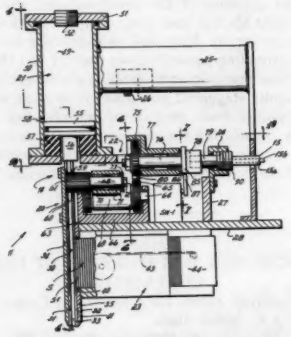


insertion of said needle while limiting the rotation of the fastener attachment member around the axis of its filament after expulsion from the needle.

4,215,808
PORTABLE ELECTRIC FASTENER DRIVING APPARATUS

Roger W. Sollberger, 5614 Beechmont Ave., Cincinnati, Ohio 45230, and Walter J. Webb, 5117 Colerain Ave., Cincinnati, Ohio 45223

Filed Dec. 22, 1978, Ser. No. 972,274
Int. Cl.[2] B25C *5/10*
U.S. Cl. 227—146 **31 Claims**



1. A fastener driving apparatus comprising a fastener gun having,

a fastener driving element,

an air spring means including a drive piston operatively connected to said driving element,

means to move said piston to charge said air spring means, and to release said piston, when said air spring means is charged, to drive said driving element for driving a fastener, and,

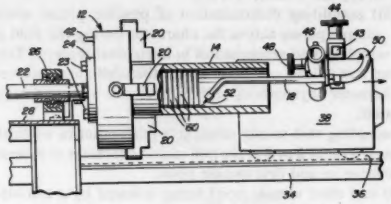
said piston moving means including a drive gear mounted for reciprocal motion toward and into engagement with said driving element for moving said driving element to charge said air spring means, and away from said driving element to disengage and to release said driving element for driving a fastener.

4,215,809

PIPE WELDING APPARATUS

Danny L. Davis, Houma, La., assignor to Salvatore Panzeca, New Orleans; Michael Badalamenti, Houma and Carlo Montalbano, New Orleans, all of, La., part interest to each

Filed Nov. 17, 1978, Ser. No. 961,888
Int. Cl.[2] B23K *9/04, 37/02*
U.S. Cl. 228—48 **1 Claim**



1. A welding apparatus for applying contiguous, coaxial weld beads on a constant radius cylindrical surface, comprising:

a work holding means for holding a workpiece having a constant radius cylindrical inner surface to be welded, and producing constant 360° rotation of said workpiece at a predetermined rate;

switch means attached to said apparatus;

cam means attached to said work holding means in operative relation to said switch means for causing one actuation of said switch means upon each 360° rotation of the workpiece in said work holding means;

weld producing means for applying a consumable electrode to the inner surface of said workpiece in the form of weld beads as the workpiece rotates, said weld producing means comprising an elongated welding head having supply means thereon for supplying weld material to the workpiece, said welding head having a length equal to the length of said workpiece and constituting the only element other than said work holding means in communication with said workpiece;

carriage means mounting said welding means for advancing said welding head axially of said workpiece; and

control means operatively connected to said switch means and said carriage means for causing said carriage means to incrementally advance by a predetermined distance upon each actuation of said switch means, said predetermined distance being substantially equivalent to the width of one weld bead.

4,215,810

CONTAINER WITH HINGED COVER

James A. Zicko, Natick, Mass., assignor to Container Corporation of America, Chicago, Ill.

Filed Jun. 27, 1979, Ser. No. 52,412
Int. Cl.[2] B65D *5/34, 5/22*
U.S. Cl. 229—33 **1 Claim**

1. A container, formed from a blank of paperboard, or the like, and having an integrally formed hinged cover, said container comprising:

(a) a tray portion and a cover portion;

(b) said tray portion including:

(i) a bottom wall;

(ii) front, rear and side walls upstanding from a foldably connected to said bottom wall along fold lines;

(iii) a tab hinged to an edge of said side wall and secured in face-to-face relationship to the inner surface of said rear wall;

(iv) said tab being relatively narrow with respect to the width of said side wall to which said tab is hinged;

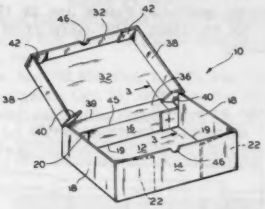
(c) said cover portion including;

(i) a top wall;

(ii) front, rear and side panels foldably connected to said top wall along hinge lines;

(iii) a flap hinged only to a rear edge of said side panel and being free of any other attachment;

(iv) said flap being sandwiched between said side panel and said side wall of said tray portion when said container is closed thereby preventing outward flaring of said side panels;



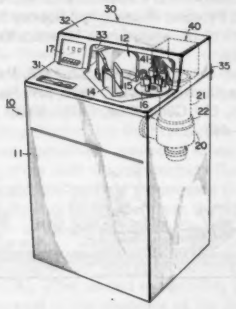
(d) a score line hingedly attaching said rear wall of said tray portion to said rear panel of said cover portion and causing said cover portion to drop back and away from said tray porion when said cover portion is disengaged from said tray portion.

4,215,811

DUST COLLECTOR IN A NOTE COUNTING MACHINE

Eiichi Kokubo; Tuyoshi Miyagawa, and Minoru Yoshida, all of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,321
Int. Cl.[2] B61L *1/16;* **G06M** *7/00*
U.S. Cl. 235—98 R **2 Claims**



1. In a note counting machine including a machine body, a counter attached to the top side of the machine body for counting bills introduced therein, and an upper cover attached to the upper portion of the machine body for covering the counter, the improvement comprising:

means positioned on one side of said cover for connecting said cover to said machine body so that the side opposite said one side is movable away from said machine body from a first position such that said cover rests on said machine body, to a second position sufficient for providing manual access to the interior of said machine body;

means for providing suction disposed within said interior;

means for filtering, removably disposed within said means for providing suction; and

suction port means disposed in said cover adjacent to said counter, said suction port means being positioned and dimensioned to be in substantially sealed fluid communica-

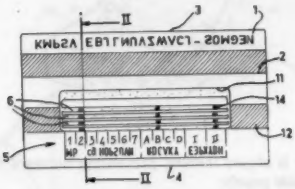
tion with said means for providing suction, when said cover is disposed in said first position.

4,215,812

MAGNETIC INFORMATION CARRIER

Georges Chancel, Saint-Peray, France, assignor to Crouzet, Paris, France

Filed Jan. 18, 1979, Ser. No. 4,598
Claims priority, application France, Jan. 24, 1978, 78 02257
Int. Cl.[2] G06K *19/06;* **G11B** *25/04*
U.S. Cl. 235—493 **1 Claim**



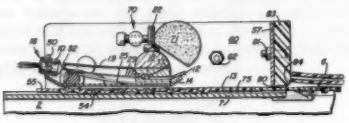
1. A magnetic information carrier comprising two magnetic tracks, and in which at least some magnetic information of the carrier may be displayed, due to the positioning of zones of concentration of magnetic particles of a liquid and due to other readable information printed on the carrier, characterized in that one of the two tracks is a track containing coded magnetic information and the other of the two tracks is a track for displaying at least some of said coded magnetic information, said display track being deposited in a series of parallel longitudinal depressions formed in the carrier and filled with said magnetic liquid.

4,215,813

EMBOSSED CHARACTER READER

James E. Hill, Prospect Heights, and Baesley I. Dahlstrom, Des Plaines, both of Ill., assignors to Dynetics Engineering Corp., Wheeling, Ill.

Division of Ser. No. 723,215, Sep. 14, 1976, Pat. No. 4,119,270.
This application May 22, 1978, Ser. No. 907,959
Int. Cl.[2] G06K *7/04, 13/06;* **B65H** *3/52*
U.S. Cl. 235—448 **13 Claims**



9. Method of reading arabic and numeric characters having a plurality of character segments comprising:

(a) scanning said characters backwards along only four discrete paths by movement of said characters relative to a plurality of segment sensors at least one of each sensors being disposed in each of said paths;

(b) said paths being defined:

(1) as a first track T1 defined across a top horizontal portion of said character;

(2) as a second track T2 defined across a top vertical portion of said character;

(3) as a third track T3 defined across a center horizontal portion of said character; and

(4) as a fourth track T4 defined across a lower vertical portion of said character;

(c) the scanning of said character segments being substantially independent of:

(i) the rate of said movement, and

(ii) timed advancement of segments relative to said sensors;

(d) initiating the start of a character read cycle upon sensor state transition from a common recognition state in vertical segment Tracks **2** or **4**,

(i) said transition defining the initiation of a first sensor state sampling point at the beginning of a character,

(ii) terminating said first sensor state sampling point upon both said sensors of Tracks **2** and **4** being in a common recognition state, thereby

(iii) permitting determination of possible plural additional sample points across the character during the read cycle;

(e) sampling said sensor states in horizontal segment Tracks **1** and **3** at at least one point across the width between vertical character segments of said character as a second sampling point;

(f) sampling said sensor states at a third point in vertical segment Tracks **2** or **4** at the end of said character as determined relative to said first sample point,

(i) said third sample point being initiated by a transition in either of Tracks **2** or **4**,

(ii) said third sample point terminating upon both sensors of Tracks **2** and **4** being in a common recognition state;

(g) terminating said character read cycle upon all four track sensors being in a common recognition state; and

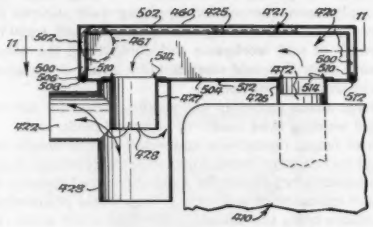
(h) comparing the sensor recognition states of the character samples to uniquely identify said character as determinative of reading said character.

4,215,814

FLUE GAS TRAP AND DIVERTER

Edward A. Ebert, 203 Huxley Dr., Snyder, N.Y. 14226

Filed Jan. 3, 1978, Ser. No. 866,458
Int. Cl.[3] F23J *11/02*
U.S. Cl. 236—1 G **9 Claims**

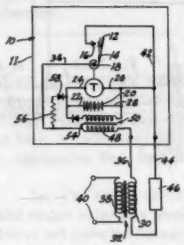


1. A discrete hot gas trap attachment for connection between the outlet flue of a heater in an environ space and a chimney to either vent hot flowing gases freely from said outlet flue to said chimney or to choke hot passive gases from said outlet flue to said chimney comprising an elongated horizontal housing including a base plate and a top plate connected to each other by sidewalls for defining a horizontal choke chamber, a heater connection duct depending from the lower side of said base plate for connection to said outlet flue, a chimney leg duct and a shroud portion depending from said base plate and being positioned in laterally spaced relationship to said heater connection duct, said shroud portion extending below said chimney leg duct with said shroud portion being in vertical alignment with said chimney leg duct, said shroud portion and said chimney leg duct being open to said environ space, and a chimney connection duct having its vent opening at or below said base plate and in communication with both said chimney leg duct and said shroud portion for venting said outlet flue to said chimney to vent hot flowing gases freely or for venting said environ space to said chimney to choke hot passive gases from said outlet flue.

4,215,815
BATTERY OPERATED THERMOSTAT TIMER WITH BATTERY CHARGING CIRCUITS

Robert C. Krump, Waterloo, Ill., assignor to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 933,217, Aug. 14, 1978, Pat. No. 4,177,923, which is a continuation of Ser. No. 800,508, May 25, 1977, abandoned. This application Jun. 18, 1979, Ser. No. 49,533
Int. Cl.[2] H02J *7/00;* F23N *5/20*
U.S. Cl. 236—46 R 1 Claim

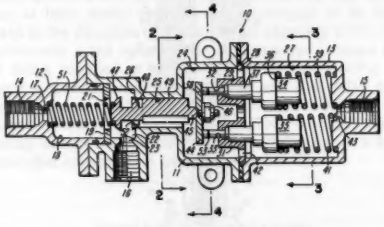


1. In a timer controlled space thermostat for switching a circuit connecting remote space conditioning apparatus with a remote A. C. power source, thermostatic switching means in said circuit, electrically operated timer means for periodically chaning the temperature set point of said thermostat, a rechargeable storage battery for operation of said timer means, means for charging said battery when said thermostatic switching means is closed comprising a transformer having a primary winding in said circuit and a secondary winding connected across said battery, and current rectifying means connected in series with said secondary and said battery, and means for charging said battery when said thermostatic switching means is open comprising circuit means connecting a resistor, a diode, and said battery in series across said thermostatic switching means.

4,215,816
THERMALLY CONTROLLED VALVE WITH SAFETY INSPECTION FEATURE

Thomas J. Lord, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Feb. 9, 1978, Ser. No. 876,529
Int. Cl.[2] G05D *23/12*
U.S. Cl. 236—99 E 9 Claims

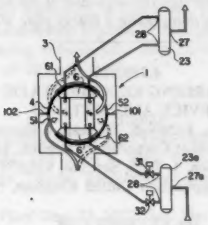


1. A valve including fluid control means and redundant thermal actuators therefor, said thermal actuators each having a part movable in response to sensed changes in fluid temperature, a housing commonly enclosing said thermal actuators and providing for fluid flow therethrough in simultaneous contact with said thermal actuators, and sighting conduits extending from the exterior of said housing to the interior thereof and each providing a sighting end within the housing and a viewing end outside the housing, the said sighting end of each of said conduits being fixed in said housing in an adjacent relation to a respective movable part and each of said movable parts having viewable portions thereon which as seen through respective sight conduits identify operational positions of said actuators the viewing ends of said sight conduits being presented for convenient comparison of images seen.

4,215,817
DEVICES FOR HEATING PREMISES BY THE USE OF HEAT PUMPS

Jean-Charlemagne Delaporte, Saint Bruno de Montarville, Canada, assignor to S.A. dite Compagnie Generale de Chauffe, Saint Andre, France

Division of Ser. No. 730,454, Oct. 7, 1976, Pat. No. 4,122,892. This application Oct. 23, 1978, Ser. No. 953,600
Claims priority, application France, Oct. 16, 1975, 75 32232
Int. Cl.[2] F25B *13/00;* B01D *45/18*
U.S. Cl. 237—2 B 13 Claims



1. An improved device for and in combination with heating premises utilizing a heat pump, comprising

premises to be heated,

at least two evaporators mounted adjacent the premises and having refrigeration fluid circulating therethrough when activated, respectively,

means for continuously directing air withdrawn from the premises at a temperature higher than 0° C. onto both of said evaorators in sequence one after the other for cooling the air, said two evaporators being arranged in series with respect to the flow of the air and recovering heat energy from the air withdrawn from the premises, said means including means for reversing the sequence of the flow of the air onto said evaporators,

a separate heating fluid means for heating the premises,

condenser means operatively connected to said evaporators in communication with the refrigeration fluid for reheating the separate heating fluid means used for heating the premises by the recovered heat from the air being transferred to the heating fluid means via the refrigeration fluid,

means for operating each of said evaporators in cycles one at a time while the other of said evaporators is inactivated, and with reversal of the sequence of the flow of the air onto said evaporators for simultaneously effecting a reversal in the operative and inactivated conditions of said evaporators, respectively, such that said first-mentioned operative evaporator simultaneously with the reversal of the sequence of flow of the air is momentarily and completely inactivated totally stopping circulation of refrigeration fluid therethrough and activating said other evaporator, initially with the air withdrawn from the premises being directed first onto one of said evaporators and in sequence then onto another of said evaporators, while said one evaporator is inactivated with no refrigeration fluid therethrough and said another evaporator is activated with circulation of the refrigeration fluid therethrough, with the air defrosting said one evaporator and being cooled and expelled at a temperature lower than normal such that said another evaporator becomes frosted, such that the reversing of the activated and inactivated condi-

tions of said evaporators, respectively, as well as the reversing of the sequence of the flow of air to be cooled and expelled being effected as soon as the activated said another evaporator becomes covered with frost and said one evaporator is defrosted, thereupon reversing the sequence of the air flow, inactivating said another evaporator totally stopping the circulation of refrigeration fluid therethrough and activating said one evaporator, and so on cyclically, all reversals and operational conditions being effected continuously without interruption without other change in the operation of the refrigeration, in the heating fluids and in intake of the air, and also without any effect on the temperature of the heating fluid means, the defrosting of the inactivated evaporator being effected by the heat alone contained in the air withdrawn from the premises, ensuring per se only the heating of the premises due to removal of considerable quantities of heat from the air, by considerably lowering its temperature,

said means for reversing the sequence of the flow of air over the evaporators comprising a faucet pipe with apertures.

4,215,818

INDUCTION CHARGING ELECTROSTATIC SPRAYING DEVICE AND METHOD

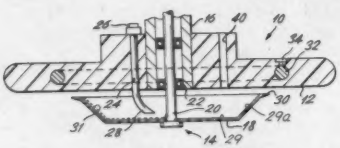
Peter R. Hopkinson, Fulwood, England, assignor to National Research Development Corporation, London, England

Filed Sep. 1, 1978, Ser. No. 938,875

Claims priority, application United Kingdom, Sep. 20, 1977, 39143/77

Int. Cl.[2] B05B 5/04

U.S. Cl. 239—3 **10 Claims**



1. A method for the electrostatic spraying of a liquid comprising the steps of distributing the liquid in a thin layer, exposing the layer to an electric field by means of an electrode embedded in a molded insulating member, providing a charge flow path from the layer such that inductive charging of the liquid occurs and causing the charged liquid to be atomized by mechanical means to produce a spray of charged droplets, disposing said insulating member so as to substantially determine the direction of emergence of said spray.

4,215,819

APPARATUS FOR EXPLOSIVE APPLICATION OF COATINGS TO ARTICLES

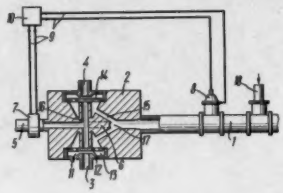
Alexandr P. Garda, ulitsa Yanvarskogo vosstania, 24a, kv. 54; Oleg A. Andruschak, ulitsa Semashko, 12, kv. 107; Alexei P. Epik, ulitsa Gorkogo, 9, kv. 19; Sergei A. Kozlov, ulitsa Korotchenko, 25a, kv. 29; Evgeny F. Grechishkin, ulitsa Chelyabinskaya, 9, kv. 131; Georgy A. Voronin, prospekt 40 Letia Oktyabrya, 94/2, kv. 44; Viktor N. Krendelev, ulitsa Orlovskaya, 19, kv. 1, all of Kiev, U.S.S.R.; Grigory V. Samsonov, deceased, late of Kiev, U.S.S.R.; Nadezhda A. Samsonov, administrator; Natalya G. Samsonov, administrator, both of Vladimirskaya ulitsa, 51/53, kv. 43, Kiev, U.S.S.R., and Evgeny G. Samsonova, adminstrator, Leninsky prospekt, 44, kv. 199, Moscow, U.S.S.R.

Filed Dec. 20, 1977, Ser. No. 862,339

Int. Cl.[2] B05B 1/24, 17/00

U.S. Cl. 239—81 **8 Claims**

1. An apparatus for explosive application of powder coatings to an article comprising: a barrel through which said powder is fed to said article; sources of purging gas and fuel gases under pressure having outlet pipes for feeding said gases to said barrel, the pressure of said purging gas source exceeding the pressure of each of said fuel gas sources; a gas distribution unit having a fuel gas mixing chamber arranged in an entrance opening of said barrel and connecting said outlet pipes to said barrel, outlet openings of said fuel gas outlet pipes being arranged opposite one another in said gas distribution unit, a passage in said gas distribution unit connecting an outlet opening of said purging gas outlet pipe to said outlet openings of



said fuel gas outlet pipes; and valve means incorporated in said passage and being mounted between the outlet openings of said fuel gas outlet pipes and said mixing chamber, said valve means admitting said fuel gases to said barrel when in the open position and shutting off the flow of said fuel gases when in the closed position during the admission of purging gas to said barrel, each valve means comprising a plate having overflow apertures in a peripheral portion and a middle portion for closing the outlet opening of a respective fuel gas outlet pipe.

4,215,820

INJECTION DEVICE FOR AN INTERNAL COMBUSTION ENGINE

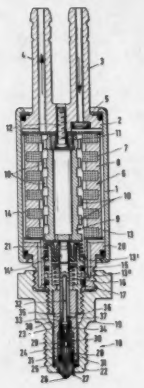
Udo Renger, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,362

Claims priority, application Fed. Rep. of Germany, May 5, 1977, 2720144

Int. Cl.[2] B05B 1/30

U.S. Cl. 239—90 **4 Claims**



1. In an injection device having at least one injection nozzle arrangement with a nozzle for intermittent discharge of a prescribed quantity of fuel, the nozzle arrangement being actuatable in response to an increased fuel pressure therein, and having an inlet communicating with said nozzle arrangement for supplying fuel thereto; the improvement comprising an outlet communicating with said nozzle arrangement for partial return of said fuel supplied thereto to provide a flow of fuel through said nozzle arrangement, and means for limiting said flow between said inlet and outlet at least temporarily to allow

an increase in fuel pressure required to actuate said nozzle arrangement, wherein said nozzle arrangement is provided with a chamber and said flow limiting means comprises a critical flow-through throttle communicating with said chamber, wherein said injection device has a pump upstream of said chamber comprising a pump piston which is axially displaceable for actuating said nozzle arrangement, said piston having an axially-extending delivery duct connected to said inlet, and wherein suction valve means are provided at the outlet end of said delivery duct adapted to remain open on normal pressure in said chamber and to close in response to increased fuel pressure in said chamber.

4,215,821

FUEL INJECTION NOZZLE

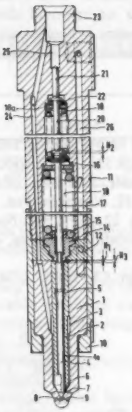
Ewald Eblen, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,828

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1977, 2711390

Int. Cl.[2] F02M *61/04*

U.S. Cl. 239—533.4 **7 Claims**



1. A fuel injection nozzle for internal combustion engines comprising a nozzle body provided with a first valve needle that opens against a closing spring and thereby adapted to control at least a first injection opening, said first valve needle, when at least partly opened, being arranged to be further loaded in the direction of closing by an adjusting piston that is continuously acted upon by the instantaneous pressure of the fuel being supplied at all times, said further loading being iniated at a predetermined position of said first valve needle, further characterized wherein said fuel injection nozzle has a second valve needle which controls at least a second injection opening and said second valve needle is formed as a hollow needle that encompasses the first valve needle.

4,215,822

DRIP LEVEL IRRIGATION

Raphael Mehoudar, Tel Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel Aviv, Israel

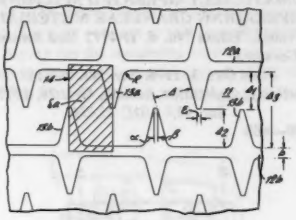
Continuation of Ser. No. 604,840, Aug. 14, 1975, abandoned. This application Dec. 18, 1978, Ser. No. 970,171

Claims priority, application Israel, Aug. 14, 1974, 45468; Apr. 25, 1975, 47172

Int. Cl.[3] B05B *1/02*

U.S. Cl. 239—542 **19 Claims**

1. An emitter unit comprising wall means for defining an elongated flowpath, an inlet and an outlet for said unit, means for coupling the unit to an irrigation installation, two sets of oppositely directed baffles projecting into said flowpath, characterized in that each baffle is of substantially triangular shape and terminates in a narrowed baffle tip of a width ξ where $0<\xi<0.25\Delta$ where Δ is the minimum throughflow spacing in



the emitter, the baffles of one set being respectively directed towards the inter-baffle regions of the opposite set, the tip of each baffle being substantially aligned with the tips of the opposite pair of adjacent baffles.

4,215,823

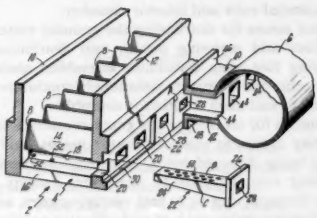
LASER NOZZLE CONSTRUCTION

Roger L. Wahl, and John A. Dye, both of Lake Park, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1977, Ser. No. 863,493

Int. Cl.[2] B05B *1/14*

U.S. Cl. 239—553.3 **2 Claims**



1. A laser nozzle comprising a plurality of stacked elongated nozzle members, each nozzle member having two elongated projections on each side thereof, a forward projection and a rearward projection, each rearward projection being formed having a flat outer surface, each forward projection being formed having a tapered outer surface, said tapered outer surface tapering inwardly as it extends to the forward end of the nozzle member, said nozzle members being placed adjacent each other so that in their stack the flat surfaces of the rearward projections meet to form a solid wall and said forward projections are spaced, adjacent forward projections of adjacent nozzle members forming an elongated nozzle having a throat, a cavity being formed between each pair of meeting rearward projections and spaced forward projections of adjacent nozzle members, side plates enclosing the ends of the plurality of nozzle members, end plate means being placed at each end enclosing the ends of the cooperating side plates and exposed surface of the end nozzle members, a hot gas flow distributor liner being fixedly positioned in each cavity, opening means through one of said side plates for directing a gas flow to each hot gas flow distributor liner, each hot gas flow distributor liner having a plurality of openings along its length positioned adjacent the throat of the elongated nozzle for delivering the gas flow directly to the throat of the elongated nozzle formed by adjacent nozzle members to minimize temperature losses in the hot gas, said hot gas flow distributor liner being tapered inwardly as it extends from its end receiving the

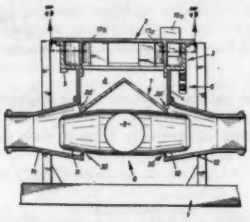
gas flow from its opening means to increase thermal response at the downstream end.

4,215,824

PNEUMATICALLY-OPERATED MACHINE FOR SPREADING GRANULAR MATERIAL

Heinrich Weiste, Elfsen No. 6, D-4772 Bad Sassendorf, Fed. Rep. of Germany

Filed Oct. 3, 1978, Ser. No. 948,151
Claims priority, application Austria, Oct. 21, 1977, 7553/77
Int. Cl.² A01C *15/04*
U.S. Cl. 239—655 **19 Claims**



1. A pneumatically-operated machine for spreading granular material comprising:

metering means for receiving granular material from a storage receptacle, and for metering the received granular material, said metering means having an interior chamber, an inlet through which said granular material passes into said interior chamber and an outlet from which said granular material exits said interior chamber;

distributor means for distributing the granular material exiting from said metering means, said distributor means including two main distributor assemblies spaced from one another and a separate main supply conduit connected to each of said main distributor assemblies;

ejector means for transfering the granular material from said metering means to said distributor means, said ejector means being disposed below said interior chamber and including two substantially horizontal venturi nozzles, means for supplying air to said venturi nozzles, and a pair of collector nozzles, each of said collector nozzles having a first end adjacent one of said venturi nozzles and in communication with said outlet of said metering means, each of said collector nozzles having a second end connected to and in communication with one of said main supply conduits whereby air supplied to said venturi nozzles draws the granular material through the outlet of said metering means and passes the granular material through said main supply conduits to said main distributor assemblies; and

a distributor member supported in said interior chamber and including inclined surfaces downward and outwardly disposed within said interior chamber toward said venturi nozzles so that said granular material is distributed to each of said main distributor assemblies.

4,215,825

CRUSHER WITH IMPACTING BARS

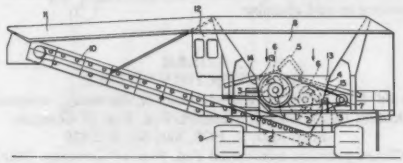
Ulrich Fritz; Willibald Kamm; Thorwald Kipp, and Udo Sudmersen, all of Bad Oeynhausen, Fed. Rep. of Germany, assignors to Weserhütte Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 969,147
Int. Cl.² B02C *13/286*
U.S. Cl. 241—34 **3 Claims**

1. In a stationary or mobile roll crusher which crushes loaded material by impact and pressure, comprising a crusher housing, a loading hopper, a pair of mutually oppositely rotatable rolls holding impacting tools, and fixed or adjustable crushing bars mounted to the crushing wall of the crusher housing,

the improvement comprising means mounting said pair of mutually oppositely rotatable rolls independently of the other together with two oppositely located crushing walls in one common crusher housing,

roof-like chute means mounted above a gap between said pair of rolls and adapted to distribute the material in the hopper and feed it to crushing regions,



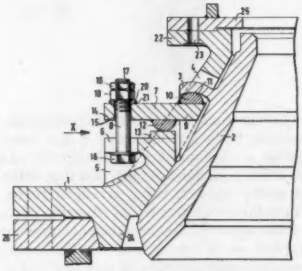
and gridiron means independently insertable into feed ducts to the crushing regions, said gridiron means being capable of blocking in whole or in part said feed ducts and by step-like insertion or removal dissolving any material cloggings, and means whereby said gridiron means are automatically inserted upon power failure to prevent crusher jamming.

4,215,826

MECHANISM FOR MOUNTING THE SHELL OF THE BREAKER IN CONE CRUSHERS

Arnold Schäfer, Neustadt, Fed. Rep. of Germany, assignor to IBAG-Vertrieb GmbH, Neustadt, Fed. Rep. of Germany

Filed Feb. 22, 1979, Ser. No. 14,039
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1978, 2810419
Int. Cl.² B02C *2/04*
U.S. Cl. 241—207 **5 Claims**



1. A mechanism for holding the shell of the breaker in a cone crusher of the type having a housing with a vertical axis and a breaker shell within the housing, the improvement comprising,

said breaker shell having distributed symmetrically over its intermediate zone of its outer surface a plurality of pockets each comprising a projecting canopy-like portion,

said housing including an upper part containing openings through which said pockets on the breaker shell are adapted to project,

a plurality of double arm levers corresponding to the number of said pockets, each of said double arm levers having a fulcrum, a first arm extending radially inwardly from the fulcrum and into a pocket from below and a second arm extending radially away from the fulcrum and said shell,

counter support means on the housing to support said fulcrum,

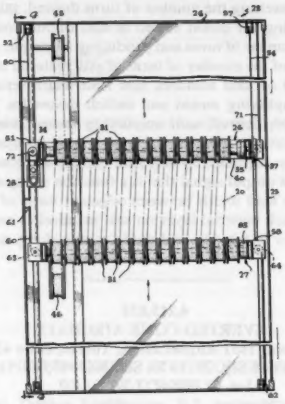
the second arm of each said lever being connected to the said upper part of the housing by a bolt.

4,215,827

FILM LOOP APPARATUS

Marvin A. Roberts, 4111 Mourning Dove Way, Calabasas, Calif. 91302, and Joseph C. Wary, 15222 Rayen St., Apt. 2, Sepulveda, Calif. 91402

Filed Jun. 25, 1979, Ser. No. 51,827
Int. Cl.[2] B65H *75/00, 17/42*
U.S. Cl. 242—55.01 **11 Claims**



1. Film loop apparatus for controlling the tension of a length of continuous film formed in an endless loop comprising the combination of:

a framework enclosing a portion of the film length therein;

carriage means movably mounted on said framework for supporting said portion of film length within said framework;

roller means movably supporting said portion of film length on said carriage means;

first sensor means carried on said framework and engagable with said portion of film length operable in response to a first slack condition to move said carriage means so as to remove said first slack condition; and

second sensor means carried on said framework and engagable with said portion of film length operable to drive said roller means in response to a second slack condition so as to remove slack not removed when sensed by said first sensor means.

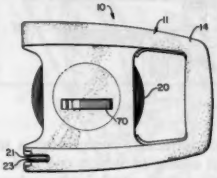
4,215,828

TAPE MEASURE REEL LOCK

Richard H. Rathbun, Oakdale, and William J. Hildebrandt, West Simsbury, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Continuation of Ser. No. 869,840, Jan. 16, 1978, abandoned. This application Apr. 23, 1979, Ser. No. 32,487
Int. Cl.[2] G01B *3/10*
U.S. Cl. 242—84.8 **4 Claims**

1. In a crank operated tape measure having a case with spaced sidewalls, a rotatable reel with a generally cylindrical drum extending between the spaced sidewalls and a crank at one axial end thereof for rotating the reel, a measuring tape with an inner end secured to the reel for being wound onto the drum by rotation of the reel in one angular direction, and a reel lock for selectively locking the reel against rotation in at least the opposite angular direction, the improvement wherein the reel lock comprises an elongated locking slide, the case sidewall at the opposite axial end of the drum from the reel crank having an elongated slot and the locking slide having an elongated blade extending through the elongated slot and being manually reciprocable along the slot in first forward and second rearward opposite directions to locking and unlocking positions thereof respectively, the reel having integral abutment means with a latching shoulder engageable by the locking slide blade with the locking slide in its locking position for locking the reel against rotation in said opposite angular direction against paying out the measuring tape from the reel and a second camming shoulder for camming the locking slide in said second direction from its locking position upon rotation of the



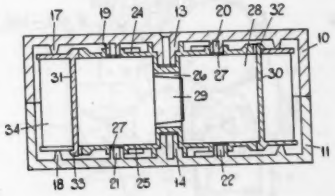
reel in said one angular direction, the locking slide having a longitudinally forwardly extending cantilever leaf spring engageable with said opposite sidewall, and said opposite sidewall having an inclined ramp engageable by the forward end of the leaf spring as the locking slide is shifted in said first forward direction from its unlocking position to an intermediate position between its unlocking and locking positions, the said ramp and leaf spring cooperating to snap return the slide to its unlocking position when the slide is cammed in said second direction to its said intermediate position by the camming shoulder.

4,215,829

COILABLE TAPE MEASURES

John A. Boyllin, Birmingham, England, assignor to Rabone Chesterman Limited, Birmingham, England

Filed May 4, 1979, Ser. No. 36,010
Claims priority, application United Kingdom, May 10, 1978, 18601/78
Int. Cl.[2] G01B *3/10*; B65H *75/48*
U.S. Cl. 242—107 **6 Claims**



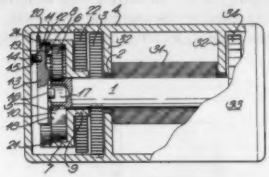
1. A coilable tape measure comprising a casing, a coilable tape having an outer end extending through an opening in the wall of the casing, and a recoil spring having its outer end connected to the inner end of the tape, the spring being mounted on an inner spool and the tape being mounted on a concentric outer spool rotatably mounted with respect to the inner spool and the inner spool being provided with means for preventing rotation thereof relatively to the casing, said means comprising a number of pegs and corresponding openings on a pitch circle of which the centre coincides with the common axis of the spools.

4,215,830

SAFETY BELT RETRACTORS

Douglas J. Cunningham, Steep Marsh, Nr. Petersfield, England, assignor to Britax (Wingard) Ltd., England

Filed Jun. 13, 1979, Ser. No. 47,975
Int. Cl.[3] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107 **10 Claims**



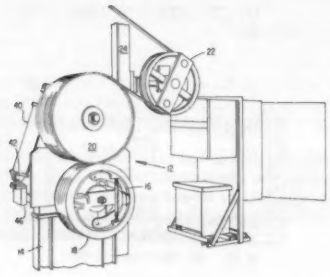
1. A safety belt retractor, comprising: a main spring; an auxiliary spring; a casing to which one end of each of said springs is anchored; a shaft which rotates when a safety belt is extracted from and retracted by the retractor, the auxiliary spring having its other end connected to said shaft for applying a continuous bias thereto; a sun and planet gear assembly including a gear ring, a planet gear and a sun gear in drivable engagement with one another, said shaft being fast with the sun gear, the other end of said main spring being coupled to said gear ring; a stop to limit orbital motion of the planet gear when the shaft is rotated, whereby the shaft is drivably coupled to the main spring through said assembly; and, a main spring lock out mechanism, said mechanism including means for securing the gear ring against rotation, after the belt has been extracted, whereby the main spring stores its wound energy and its drive is disconnected from the shaft.

4,215,831

WINDING APPARATUS

Robert A. Williams, 165 Garfield Dr., Painesville, Ohio 44077; William A. Cotton, 10803 Kile Rd., Chardon, Ohio 44024, and Robert B. Hoskinson, 9124 Highland Ct., Mentor, Ohio 44060

Continuation of Ser. No. 864,832, Dec. 27, 1977, abandoned.
This application Jul. 6, 1979, Ser. No. 55,276
Int. Cl.[3] B65H *54/28*
U.S. Cl. 242—158 F **12 Claims**



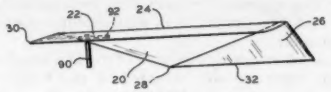
1. An apparatus for winding rigid strip material into a coil without side restraints, comprising a mandrel for receiving the strip material; means for rotating the mandrel about a first axis; guide means mounted adjacent to said mandrel and operable to guide said strip material from a source onto the surface of said mandrel, and means for moving said guide means along a second axis parallel to said first axis whereby said strip material is helically wound onto said rotating mandrel; the improvement comprising said means for moving said guide means along said second axis including a linear actuator connected to said guide means and operable to move said guide means along said second axis between a first position aligned with a first predetermined point on the surface of said mandrel and a second position aligned with a second predetermined point on the surface of said mandrel, and control means operatively connected to said actuator means for controlling movement of said guide means along said second axis in synchronization with the angular position of said mandrel, said control means including means for counting the number of turns of said strip material in each material layer on said mandrel and means for setting the lead width between adjacent turns of said strip material in each material layer on said mandrel, said counting means including a digital counter, a comparator, and switch means for presetting the number of turns desired, said comparator comparing the count stored in said digital counter with said preset number of turns and producing an output signal that is a function of the number of turns of said material in the layer being wound on said mandrel, said lead width setting means including amplifying means and switch means for presetting the lead width desired, said amplifying means being electrically connected to said output signal of said comparator and having its gain regulated by said lead width switch means so as to produce an output signal that is a function of the number of turns and the lead width between adjacent turns of said strip material in each material layer on said mandrel to control said linear actuator in moving said guide means along said second axis.

4,215,832

INVERTED CONE AIRCRAFT

George L. Horn, 1831 Airport Hwy., Toledo, Ohio 43609

Filed Sep. 29, 1978, Ser. No. 947,068
Int. Cl.[2] B64C *3/10*, *31/02*
U.S. Cl. 244—16 **10 Claims**



1. An aircraft comprising a body having sides formed in the shape of an inverted cone with a lower point, a generally planar upper edge and a sector shaped opening, a downwardly extending rim formed about the upper edge of said body and having an inner edge attached to the upper edge of said body, an outer edge and an opening adjacent the sector shaped opening, and a tail section formed along a longitudinal axis of said body, said sector shaped opening and the opening in said rim.

4,215,833

CABLE-CUTTING DEVICE

Nelson Chan, Winnipeg, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

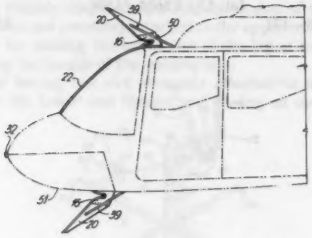
Filed Jan. 16, 1979, Ser. No. 3,853
Claims priority, application Canada, Dec. 7, 1978, 317555
Int. Cl.[2] B64C *27/00*
U.S. Cl. 244—17.11 **29 Claims**

1. In combination with an aircraft, a safety device for protecting the aircraft, when airborne, from cable strikes by horizontally strung cables under tension, said device comprising

a pair of stationary co-planar co-acting cable-cutting edges arranged at a suitable angle to each other to produce a wedge-like mechanical advantage while presenting a fresh cutting edge to a cable as it simultaneously engages and advances between said cable-cutting edges toward the junction of said cable-cutting edges, the perpendicular distance between the point of engagement of said cable with said cable-cutting edges and the junction of said cable-cutting edges being sufficient to permit at least partial cutting of said cable, due to the energy of motion of

the aircraft, before it reaches said junction so that the cable will fail under moderate tension

the device being substantially vertically attached to the



forward portion of the aircraft with the opening defined by the angled cable cutting edges facing forwardly and the junction thereof being disposed rearwardly of said opening.

4,215,834

COMPOUND AEROSTAT OF CONTROLLABLE ALTITUDE

Richard M. Dunlap, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1978, Ser. No. 969,770
Int. Cl.³ B64B *1/62*
U.S. Cl. 244—97 **12 Claims**

1. A controllable altitude lifting system for an aerostat comprising:

a passive altitude lifting control system including a first enclosure containing a primary gaseous fluid, said primary gaseous fluid having solely passive condensing and vaporizing means controlled by ambient conditions for providing altitude stability, said condensing and vaporizing means comprises methanol; and

an active altitude lifting control system including a second enclosure having a secondary gaseous fluid within, absorbing means connected to controllably absorb said secondary gaseous fluid and dissociation and vaporization means for dissociating and vaporizing the absorbed secondary fluid.

4,215,835

ARM NET SYSTEM FOR EJECTION SEATS

Gordon J. Wedgwood, 36, Sandy La., Little Sandhurst, Crowthorne, Berkshire, England

Filed May 24, 1978, Ser. No. 909,152
Int. Cl.² B64D *25/10*
U.S. Cl. 244—122 AG **13 Claims**

1. A seat mounted arm restraint net system for restraining an ejection seat occupant's arm during a seat ejection sequence comprising

a seat mounted for ejection from a vehicle, said seat having a back portion and a seat pan portion,

a net having one side fixedly secured along its length to said seat proximate to each of said back portion and said seat pan portion, said net normally being in a stowed position,

a static line attached to a free side of said net and having one end anchored to said seat and its other end capable of being releasably secured to a vehicle from which said seat is to be ejected, and

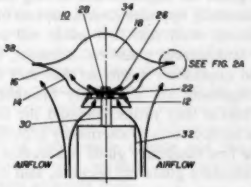
means connected with said static line and net interjacent the ends of said free side of said net and operable to deploy said net to cast said free side of said net laterally outward from said seat and then inwardly toward said seat to encompass a seat occupant's arm.

4,215,836

INFLATABLE DECELERATOR

Alexey T. Zacharin, Parsippany, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1978, Ser. No. 956,013
Int. Cl.² B64D *19/00*
U.S. Cl. 244—138 R **6 Claims**



1. An inflatable decelerator for deployment with a load into an airstream comprising:

a ballute including:

a top panel and bottom panel defining said ballute;

means for attaching said top panel to said bottom panel;

air scoop means attached to the underside of said bottom panel containing at least one passage for admitting air into said ballute;

stiffener means attached to the top side of said bottom

panel containing at least one passage for admitting air into said ballute;

valve means placed on top of said stiffener to monitor the inflow of air;

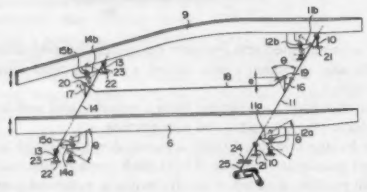
means for appending said ballute to said load, whereby, upon release into the air stream air enters said air scoop opening said valve means and inflating said ballute, and upon achieving a predetermined deceleration, said valve means closes, causing said ballute to collapse and become a streamer until said load strikes the target.

4,215,837

TRACK SWITCHING MEANS FOR GUIDEWAY VEHICLES

Yukio Uozumi, Kobe, and Fumitaka Mizoshita, Kakogawa, both of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Sep. 26, 1978, Ser. No. 946,034
Claims priority, application Japan, Sep. 30, 1977, 52-116816
Int. Cl.[2] E01B *7/08*
U.S. Cl. 246—433 **6 Claims**



1. Track means for guideway vehicles comprising running surface means adapted for having load bearing wheels of the vehicle to run thereon, and guide rail means provided at the opposite sides of and extending along the running surface means, said running surface means including a first running surface section and at least second and third running surface sections which are separated from each other and connected with said first section through an intermediate running surface section, said guide rail means including first, second and third stationary guide rail sections respectively at the opposite sides of the first, second and third running surface sections, and switching means provided in the intermediate running surface section and including at least first and second guide rail segments for connecting said first stationary guide rail section respectively with said second and third stationary guide rail sections, said first and second guide rail segments being retractable beneath the intermediate running surface section, crankshaft means extending transversely with respect to said first and second guide rail segments and having crankarms extending in diametrically opposite directions, one of said crankarms being connected with said first guide rail segment and the other with said second guide rail segment, drive means for rotating said crankshaft means so that said first and second guide rail segments are alternately brought into operative positions wherein they project beyond the intermediate running surface section so as to alternately provide guide surfaces between said first stationary guide rail section and said second and third stationary guide rail sections, said crankshaft means comprising a pair of parallel crankshafts each having said diametrically oppositely extending crankarms, said crankshafts being further provided with third crankarms which are substantially perpendicular to said diametrically oppositely extending crankarms and connected together by a link, one of said crankshafts being connected through torsionally deflectable coupling means with said drive means, stopper means being provided for restricting rotation of said crankshafts to thereby prevent the first and second guide rail segments from being moved beyond the operative positions.

4,215,838

MUSICAL INSTRUMENT STAND DEVICE

Leonard Gullota, Valencia, Calif., assignor to La Voz Corporation, Sun Valley, Calif.

Filed Sep. 14, 1977, Ser. No. 833,150
Int. Cl.[2] F16M *11/04*
U.S. Cl. 248—121 **14 Claims**

1. A collapsible instrument stand comprising:

first and second elongated base members coupled together at intermediate points thereof by swivel means, said base members having means for selectably interlocking said members together in an angular disposition;

an elongated inclinable member having first and second ends, said first end pivotally attached to said first base member adjacent one end thereof;

a center brace member for supporting said inclinable member in an inclined position, said brace member having first and second ends, said first end pivotally attached to said inclinable member, said second end removably coupled to said first base member;

a self-releasing instrument cradle attached to said inclinable member adjacent said second end thereof, comprising:

(i) a bracket member;

(ii) a pair of arm members, each of said arm members having lower and upper musical instrument contacting surfaces; and

(iii) attaching means for pivotally attaching said arm members to said bracket member such that said arm members may pivot away from one another to an open position so that a musical instrument may be placed between said arm members thereby engaging said lower contacting surfaces and causing said arm members to pivot towards one another to a closed position with said lower and upper contacting surfaces contacting the instruments; and wherein said arm members are positioned by said attaching means on said bracket member relative to one another such that when said arm members are in said closed position, the center of an instrument holding area generally defined by said upper and lower contacting surfaces is displaced above a line which connects the axes about which said arm members pivot;

whereby said stand may be collapsed from the erected position by decoupling said second end of said brace member from said first base member, pivoting said brace member toward said inclinable member, pivoting said inclinable member toward said base members, and swiveling said base members into alignment.

4,215,839

TRIPOD

Kahlil Gibran, 160 W. Canton St., Boston, Mass. 02118

Filed Oct. 10, 1978, Ser. No. 949,647
Int. Cl.[2] F16M *11/38*
U.S. Cl. 248—170 **17 Claims**

1. A tripod comprising:

a central column having at least three slots extending substantially in parallel along a portion of the column length and peripherally spaced around the column;

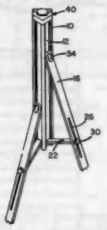
mounting means at the upper end of the column for attachment of an item to be supported;

three legs each of the same fixed length and each disposed along a respective slot, each leg having a slot along a portion of the length thereof and each including;

means slidably disposed in a respective slot of the central column and pivotably attached to the upper end of the leg;

means for locking the upper end of the leg at any position along the length of the column slot;

an arm having one end pivotably attached to the column near the lower end thereof and having an opposite end



pivotably attached to the slot of the leg and slidable therealong; and

means for locking the arm at any position along the length of the leg slot;

the legs being operative to be folded aginst the column with the arms nested in the legs, and operative to be opened to an intended angular extent and to an intended vertical extent along the length of the column;

and at any vertical extent of said legs along the length of the column, the angular extent of any of said legs can be adjusted by the position of the respective arms along the associated leg slots.

4,215,840

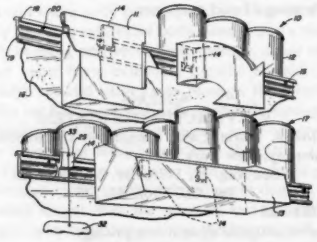
DISPLAY SYSTEM

Marion G. Babberl, San Mateo, Calif., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.

Filed Oct. 10, 1978, Ser. No. 949,769

Int. Cl.[2] A47F *7/00, 5/00*

U.S. Cl. 248—221.4 **13 Claims**



1. In a display system having a shelf rail defining upper and lower vertically spaced parallel confronting channels, the improvement comprising:

a unitary clip having a rigid connecting portion defining a rear portion and a front portion, a lower edge portion projecting downwardly from the rear portion of said connecting portion to be received in said shelf rail lower channel, an upper edge portion projecting upwardly from the rear portion of said connecting portion to be received in said shelf rail upper channel, the upper edge portion having a vertical extent substantially less than that of the lower edge portion, said lower edge portion including a reduced thickness flexible section permitting the edge portions to be deflected into the channel in mounting the clip to the shelf rail, and an upright portion projecting upwardly from the front portion of said connecting portion, defining with said upper edge portion an upwardly opening mounting channel; and

a display element having a rear wall provided with an opening through which said connecting portion forwardly extends with an edge portion of the display element rear wall defining the upper edge of said opening received in said channel removably resting in said mounting channel.

4,215,841

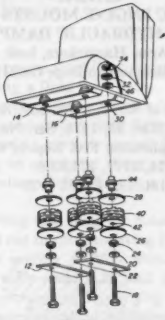
VIBRATION ABSORPTION KIT FOR VEHICLE SEATS

Arthur J. Herring, Jr., 446-18th Ave., Indian Rocks Beach, Fla. 33535

Filed Oct. 10, 1978, Ser. No. 949,474

Int. Cl.[2] F16F *15/04*

U.S. Cl. 248—635 **2 Claims**



1. A kit of resilient vibration absorption pad members of a rubber-type compound to insulate the seat of a truck, automobile, aircraft or similar type vehicle from high frequency vibrational emanations created by the vehicle chassis and power plant and transferred to the main seat support frame member attached to juxtaposed seat support frame members comprising:

a plurality of substantially circular pads dimensioned to conform to the surface area of said interconnecting juxtaposed seat support frame members abutted and interfaced by said pads, said pads positioned to interpose said seat frame members from direct contact to the interconnections, thereof to interrupt and to attenuate the direct line of vibrational transmission through said juxtaposed rigid seat frame member interconnections;

apertures within said pads positioned to correspond with apertures within said juxtaposed seat frame members to which said pads abut, dimensioned to receive snugly therethrough securing means, preferably bolts, which secure said seat support frame members;

at least one large circular contoured pad for insertion between a relatively large concave washer and a relatively large convex washer interposed between the main seat support rails of the vehicle chassis and the seat frame support members, said washers and pad being held in position by said securing bolt;

said large contoured circular pad conforming in size and shape to said washers, permiting the outer edges of said washers to overhang slightly to grip said pad snugly therebetween;

said large contoured pad having at least one aperture therethrough to receive said securing means therethrough, dimensioned to snugly receive said securing means;

at least one vibration absorption pad of generally cylindrical shape and serving as a grommet, having reduced diameter upper and lower portions such that the lower portion may

be snugly received within said convex washer and the upper portion may be received within an aperture in said seat frame support members;

said grommet pad having at least one aperture therethrough to receive said securing means therethrough, dimensioned to snugly receive said securing means;

at least one vibration absorption pad of circular shape and serving as a washer interposed between the upper surface of the seat support frame member and a washer and nut of said securing means; and

said washer pad conforming in size and shape to said washer and having at least one aperture therethrough dimensioned to receive said securing means snugly;

said grommet pad and said washer pad serving to isolate said securing means from said seat frame members;

said large pad serving to isolate said chassis plate from said seat frame members.

4,215,842

RUBBER ELASTIC ENGINE MOUNTS OR SUPPORTS WITH HYDRAULIC DAMPING

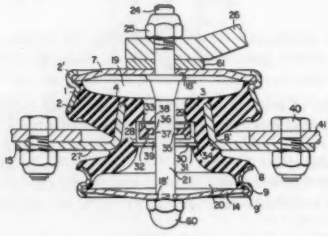
Heinz Brenner, and Arno Hamaekers, both of Ahrweiler, Fed. Rep. of Germany, assignors to Boge GmbH, Eitorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 791,309, Apr. 27, 1977. This application Mar. 23, 1978, Ser. No. 889,381

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2718121; Mar. 24, 1977, 2713008

Int. Cl.[2] F16M *5/00*

U.S. Cl. 248—562 **9 Claims**



1. An elastic rubber engine mount with hydraulic damping, especially for engine suspensions in motor vehicles, comprising a first metallic end wall for connection to an engine casing, a second metallic end wall spaced axially from said first wall, a metallic supporting element for connection to an engine supporting frame, a first elastic rubber-like peripheral wall adheringly connected with said first end wall and with said supporting element, an elastic rubber-like partition connected with said supporting element so as to define with said first end wall and said first peripheral wall a liquid-filled main chamber of variable volume on one side of said partition, a second elastic rubber-like peripheral wall adheringly connected with said second end wall and with said supporting element so as to define an auxiliary liquid-filled chamber of variable volume on the other side of said partition, means rigidly connecting said first and second end walls together for joint movement relative to said supporting element, an annular member disposed in said partition and formed with a choke opening providing flow connection between said chambers, said annular member being relatively freely axially movable normal to and relative to said partition, such that said limited movement of said annular member can compensate for limited volume changes in said chambers and the attendant initial tendancy of the liquid to increase in pressure and flow from one chamber to the other through said choke opening, the axially facing surface area of said annular member being substantially less than the axially facing surface area of either of said chambers.

4,215,843

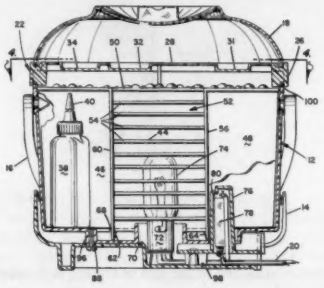
TOY MOLDING APPARATUS AND MATERIAL FOR USE THEREWITH

Derek J. Gay, Rancho Palos Verdes; Robert G. Trout, Huntington Beach; Manuel G. Y. Chin, Santa Ana, and James E. Sawyer, Irvine, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 17, 1978, Ser. No. 878,855

Int. Cl.[3] B22D *27/02*

U.S. Cl. 249—78 **9 Claims**



1. In a toy molding apparatus, the combination comprising:

a generally pail-shaped housing having an open top;

an electrical lamp mounted centrally within the bottom of said housing;

a baffle member within said housing and having a central core portion generally rectangular in cross section with each side having a plurality of louvers, said core portion substantially surrounding said electrical lamp, said baffle member having partitions extending outwardly from said core portion into abutting relation with the interior of said housing to provide at least one receptacle in thermal communication with said heat source whereby said louvers pass heated air from said lamp into said at least one receptacle;

a container having a heat-liquifiable substance therein, said container being configured for being received within said at least one receptacle for heating said substance; and

cover means for substantially enclosing the open end of said housing for retaining the heat therein whereby to facilitate the heating of said container.

4,215,844

VALVE ACTUATOR SYSTEM

Stanley Bowen, Tustin, Calif., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,242

Int. Cl.[2] F16K *31/128*

U.S. Cl. 251—28 **5 Claims**

1. A valve actuator system comprising:

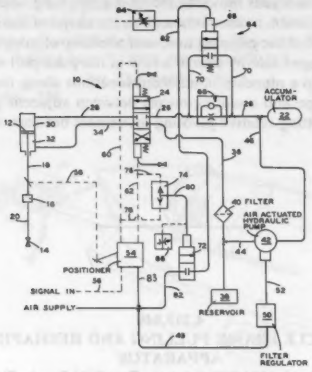
pressure source means including an accumulator charged to a predetermined pressure;

piston means connectable to a valve control member for providing linear motion in response to pressure applied from said pressure source means;

positioner means for establishing control signals in response to differences between input signals to said positioner means indicative of desired valve positions and feedback signals to said positioner means indicative of actual valve positions; and

means for moving said piston means at one of two speeds in response to the magnitude of the control signals from said positioner means including a restrictor and by-pass assem-

bly connected between said accumulator and said piston means to provide two different fluid flow volumes de-



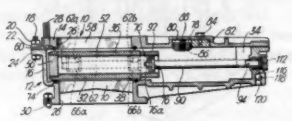
pending on the magnitude of the control signals from said positioner means.

4,215,845

ENGINE AIR CUT-OFF DEVICE

Leonard A. Sturgeon, Edmonton, Canada, assignor to Bralorne Resources Limited, Calgary, Canada

Filed Oct. 17, 1977, Ser. No. 842,691
Claims priority, application Canada, Dec. 16, 1976, 268047
Int. Cl.[2] F16K *3/00*; F02D *13/06*
U.S. Cl. 251—63 **11 Claims**



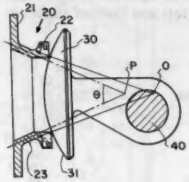
1. A cut-off device for an engine air manifold which comprises a valve body having a passage arranged for alignment with a corresponding passage in an engine air manifold, a gate reciprocally mounted in said body and having a path of movement across said valve body passage, said gate having a closed position fully blocking said valve body passage and a retracted position fully opening said valve body passage, a pair of guide strips in said valve body extending parallel to said path of movement adjacent said valve body passage, there being one guide strip for each edge of said gate, each strip having a pair of longitudinally spaced apart depressions in an upper surface thereof, one depression being longer than the other, a pair of spaced apart guide pads mounted on each edge of said gate for sliding movement on the guide strip adjacent thereto, one of said pads being longer than the other of said pads whereby when said gate is in its closed position the longer pads engage the longer depressions of the guide strips and the other pads engage the other depressions of the guide strips, means biassing said gate to said retracted position and means for moving said gate from said retracted position to said closed position, said last-mentioned means including at least one cylindrical bore in said gate parallel to said path of movement, conduit means sealingly engaging said bore, forming a piston face within said bore and including means for introducing fluid under pressure into said bore through said conduit means, and a plug closing one end of said bore and defining a piston chamber between said plug and said piston face, whereby said fluid under pressure will react against said piston face and said plug to drive the gate from the retracted position to the closed position.

4,215,846

MULTIPORTION UNITARY VALVE SEAT AND VALVE INCORPORATING IT

Mitsumasa Ishizuka, Yokosuka, and Makoto Kawai, Hiratsuka, both of Japan, assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 23, 1978, Ser. No. 889,872
Claims priority, application Japan, Apr. 1, 1977, 52/36183
Int. Cl.[2] F16K *3/22, 25/00*
U.S. Cl. 251—298 **6 Claims**



1. In an eccentric rotary fluid flow control valve including
a housing containing a fluid flow path,
a unitary seat member having an annular base portion secured in said housing along said flow path and having a rigid annular seating portion spaced from said base portion and having an axis lying along said flow path,
a plug having a seating surface having a center of curvature, and
means for supporting said plug for rotation of said seating surface into and out of force exerting fluid sealing engagement with said seating portion about an axis which is radially offset with respect to said axis of said seating portion, the improvement comprising
a resilient annular connecting wall portion for said seat member integrally joining said base portion and said seating portion together into a unitary structure and supporting said seating portion from said base portion, said wall portion being of truncated conical shape and having an inner diameter which decreases gradually and continuously from said base portion to said seating portion, with the largest value of said inner diameter being equal to the inner diameter of said base portion, with the smallest value of said inner diameter of said wall portion being equal to the inner diameter of said seating portion, andd with the apex point of the cone formed by line extensions of said wall portion lying within a cone formed by lines connecting said center of curvature of said seating surface to the points of engagement between said seating surface and said seating portion which result when said seating surface has been moved into said sealing engagement with said seating portion,
whereby force exerted on said seating portion by said plug seating surface deforms said wall portion in the direction to converge the walls, and hence reduce said inner diameter, of said wall portion.

4,215,847

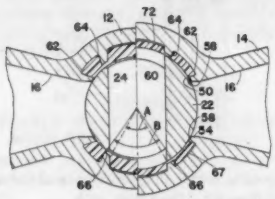
PLUG VALVE WITH LINER

Pieter F. Hoos, 1630 Yeager Rd., Royersford, Pa. 19468

Filed Sep. 6, 1977, Ser. No. 830,741
Int. Cl.[2] F16K *5/02*
U.S. Cl. 251—317 **11 Claims**

1. A plug valve comprising:
a body with a cavity of generally circular horizontal cross-sections therein;
flow passages in said body terminating in body ports at said cavity;
a complementary plug in said cavity for rotational movement therein; and
a flow passageway through said plug;

a pre-formed liner of yieldable material in said cavity receiving said plug;
said body having complete annular, top and bottom surfaces within and around said cavity; and
said top surface being larger in diameter than said bottom surface;
a pair of generally parallel, substantially axial ribs extending between said top and bottom surfaces on each side of each body port;
opposing sides of each pair of said ribs forming between them an axial dovetail groove;
the inner surface of said cavity intermediate said ribs merging with said top and bottom surfaces;



said liner having annular top and bottom sealing bands received in said top and bottom surfaces of the body; and
complementary axial dovetail seal strips received between each of said pairs of ribs to form a radially retained positive interlock therewith, said seal strips interconnecting said sealing bands with the outer surfaces thereof merging therewith;
said grooves and said ribs being vertically disposed so that said liner may be inserted axially into said cavity with said seal strips and said ribs interlocked; and
spaces between said pairs of seal strips defining port openings;
the inner surfaces of said sealing bands and seal strips engaging said plug.

4,215,848

GRIPPING AND SKIDDING APPARATUS

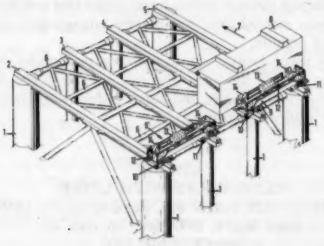
Pieter van de Werken, Sleeuwijk, Netherlands, assignor to MacGregor International S.A., Basel, Switzerland

Filed Aug. 29, 1978, Ser. No. 937,843

Claims priority, application Netherlands, Aug. 30, 1977, 7709542

Int. Cl.[2] B66F *1/00*

U.S. Cl. 254—107 **8 Claims**



1. A gripper and skidding device which is adapted to hydraulically grip a flanged top plate of a girder comprising: a main frame; hydraulically operated push-pull means carried by the frame and connectable to a structure which is to be skidded on the girder; a plurality of gripping units carried by the frame, each gripping unit having opposed gripping faces for selectively gripping and releasing between them the upper and lower surfaces of the top plate flange of the girder, means for moving at least one of the gripping faces toward and away from an opposed face and a universal joint between said moving means and said movable face for permitting said face to adjust its position to accommodate to the shape of the flange at the location of the gripping unit, said plurality of gripping units being arranged side-by-side in a row in the push-pull direction so as to grip a plurality of adjacent locations along the length of the flange; and coupling means between adjacent gripping units permitting relative pivoting movement between the gripping units.

4,215,849

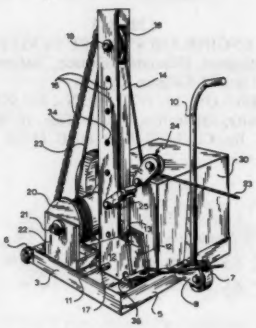
VEHICLE FRAME PULLING AND RESHAPING APPARATUS

Roger Charland, 1424 SW. 1st Ave., Deerfield Beach, Fla. 33441

Filed Jan. 5, 1979, Ser. No. 1,069

Int. Cl.[2] B66C *23/60*; B66D *3/08*

U.S. Cl. 254—326 **6 Claims**



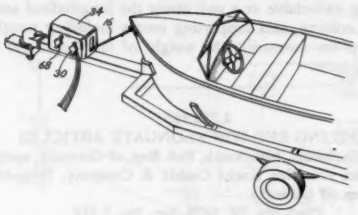
1. A vehicle frame pulling and reshaping apparatus comprising a base plate, wheels rollably carrying the base plate, a post having a lower end removably attached to the base plate and an upper end upwardly projecting from the base plate, a winch mounted on the base plate and positioned rearward of the post relative to a vehicle operatively positioned for repair forwardly relative to the apparatus and including a cable drum rotatable about a transverse axis and positioned rearward of the post, an upper cable guide pulley rotatively connected to the upper end of the post, a lower cable guide pulley operatively connected to the post selectively along the length thereof, in any predetermined position between the lower end of the post and the upper cable guide pulley, a cable wound on the cable drum, operatively passing over the upper cable guide pulley, longitudinally extending operatively forwardly from under the lower cable guide pulley and operatively connecting to a vehicle frame and side pulling on the latter, and having a cable run extending upwardly and forwardly from the cable drum to the upper cable guide pulley, a brake operatively connected to the winch and controlling the rotation thereof and the traction exerted by the cable on the vehicle frame, a chain operatively attached to the upper end of the post and to the base plate rearward of the post, operatively extending along the cable run rearwardly overlying the latter, and rearwardly restraining the post against operative forward pulling thereon by the cable, and an anchoring device connected to the base plate and operatively securing the latter relative to the ground against pulling operation by the winch.

4,215,850

WINCH

Reinhold A. Haase, Hastings; Norman D. Brockelsby, Grand Island, both of Nebr., and Daniel W. Pike, Mission, Kans., assignors to Dutton-Lainson Company, Hastings, Nebr.

Filed Nov. 7, 1978, Ser. No. 958,372
Int. Cl.[3] B66D *3/00*
U.S. Cl. 254—350 10 Claims



1. In a winch of the type including a frame, a gear train affixed to the frame, a cable drum affixed to the frame and driven by the gear train, and means for driving the gear train, the improvement of an adjustable clutch mechanism in the gear train between the means for driving and the drum, the adjustable clutch mechanism including:

a clutch shaft in the gear train;

a friction plate on the shaft and axially movable on the shaft;

said means for driving the gear train attached to the friction plate;

a clutch plate on the shaft in opposed relation to one side of the friction plate;

a thrust bearing threaded on the shaft in opposed relation to the opposite side of the friction plate; and

means for adjusting the force of the thrust bearing on the friction plate to thereby engage the friction plate against the clutch plate.

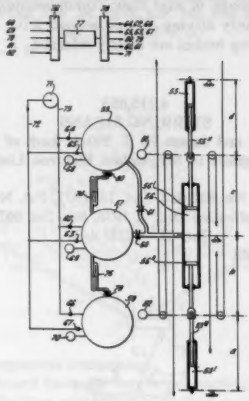
4,215,851

SYSTEM FOR ACTIVE COMPENSATION OF UNWANTED RELATIVE MOVEMENTS, PREFERABLY DURING LOADING OF CARGO

Hans K. Holmen, Sandvika, Norway, assignor to A/S Strommen Staal, Strommen, Norway

Filed Jan. 27, 1978, Ser. No. 873,422
Claims priority, application Norway, Jan. 28, 1977, 770299
Int. Cl.[2] B66D *1/48*
U.S. Cl. 254—277 9 Claims

1. A system for active compensation of unwanted relative movements, preferably during deposit of load by a crane beam, comprising a long-periodic acting system for compensation of the static loading caused by said load and a short-periodic acting system for active compensation of unwanted relative movements of the load relative to a reference level, said long-periodic system comprising a compensating cylinder provided with two pistons acting in opposite directions, said cylinder being connected through connector means to one or more pressure loaded reservoirs, said long-periodic system being pneumatic using air or inert gas as an operational medium, said short-periodic system comprising two hydraulic cylinders with respective pistons, said pistons of the short-periodic system including piston rods connected to said pistons of the long-periodic acting system, the position of said short periodic system being determined by the measurement of at least one



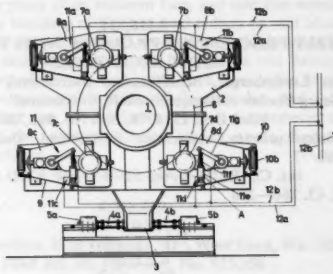
parameter involving movement of the tip of the crane beam, movement of the load, or movement of said reference level.

4,215,852

APPARATUS FOR LOCKING A CONVERTER TILTING GEAR DURING A BLASTING OPERATION

Wilhelm Ackermann, Essen; Karlheinz Langlitz, Mulheim, and Gunter Schmitz, Duisburg, all of Fed. Rep. of Germany, assignors to DEMAG, Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,336
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658885
Int. Cl.[2] C22B *5/28*
U.S. Cl. 266—89 10 Claims



1. Apparatus for locking the tilting gear of a converter during a blasting operation, comprising

(a) a pivot pin gear wheel;

(b) a plurality of drive pinions engaging said pivot pin gear wheel and spaced circumferentially therearound;

(c) a source of power; the improvement characterized by

(d) a separate first drive means for each pinion;

(e) gear train means connecting each said drive means to its respective drive pinion;

(f) arresting brakes in each said gear train means;

(g) a separate second drive means connected to each said gear train means for providing relative angular motion of each said pinion which said pivot pin gear wheel for engaging individually the teeth of each pinion with said pivot pin gear wheel;

(h) means providing simultaneous flow communication from said power source to each said second drive means; and

(i) control means in said flow communication means for synchronously driving all said second drive means when said arresting brakes are briefly released.

4,215,853

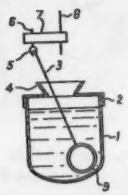
STIRRING MEANS

Peter Roebuck, and James H. T. Petch, both of Manchester, England, assignors to Magnesium Elektron Limited, United Kingdom

Division of Ser. No. 842,014, Oct. 13, 1977, Pat. No. 4,169,888. This application Dec. 7, 1978, Ser. No. 967,331

Int. Cl.² C22B 9/00

U.S. Cl. 266—235 **7 Claims**



1. Apparatus for stirring a fluid mass comprising molten metal comprising a circular curved-bottomed vessel, a curved loop-shaped paddle to be immersed in the mass and means for rotating the paddle about a substantially center axis of the loop and simultaneously rotating said loop-shaped paddle in an orbit around a fixed axis causing said center axis of the loop to orbitally rotate about said fixed axis while passing said loop close to substantially the whole of the curved bottom of the vessel and traversing substantially all the fluid mass with said curved loop by the combined rotation about said center and fixed axis.

4,215,854

MELT PROCESSING APPARATUS WITH TILTABLE MELT RECEPTACLE

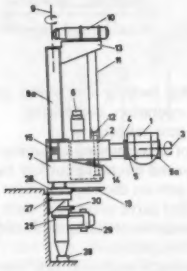
Hans Lustenberger, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Dec. 12, 1978, Ser. No. 968,730

Claims priority, application Switzerland, Dec. 14, 1977, 15360/77

Int. Cl.² B22D 41/06; F27B 14/02; F27D 3/14

U.S. Cl. 266—240 **11 Claims**



1. A melt processing apparatus having an elongated processing receptacle tiltable about a generally horizontal axis extending perpendicular to the longitudinal axis of said receptacle for producing iron-carbon melt with nodular graphite, the apparatus comprising

a generally horizontally extending beam directly coupled to and supporting the receptacle, said receptacle and said beam generally being in the same horizontal plane,

a vertical column; and

means for supporting said beam on said column, said supporting means being arranged at least partially underneath said beam for vertical movement thereof along the column, said beam, said supporting means and said receptacle being swivelable as a unit about the longitudinal axis of said column, said supporting means including weighing means for measuring the weight of said beam and said receptacle.

4,215,855

COOLING BED FOR ELONGATE ARTICLES

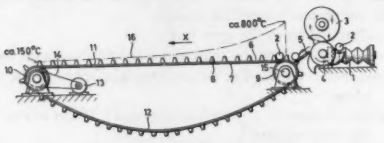
Theodor Zacharias, Meerbusch, Fed. Rep. of Germany, assignor to Firma Friedrich Kocks GmbH & Company, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 29, 1979, Ser. No. 7,319

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812777

Int. Cl.² C21D 9/00

U.S. Cl. 266—259 **14 Claims**



1. A cooling bed for the cooling and straightening of elongate articles comprising at least two endless chains arranged side-by-side parallel and adjacent to one another extending from an infeed and adjacent a delivering means to a discharge end remote therefrom and held by means of reversal wheels in the manner of a conveyor belt having upper and lower runs for transporting the articles delivered thereto along the upper runs of the chains, the chains having a plurality of projections which form pockets therebetween for receiving the articles, a number of reversal wheels at said infeed end corresponding to the number of endless chains, said reversal wheels at the infeed end being interconnected, so as to be non-rotatable relative to one another, a like number of reversal wheels at the discharge end, said reversal wheels at the discharge end being not so interconnected, and means spaced from the reversal wheels at the infeed end individually driving the chains.

4,215,856

APPARATUS AND METHOD FOR CONTROLLING GAME PLAYING TIME

Karl-Heinz Schmall, Moncalierstrasse 5, D-757 Baden-Baden, Fed. Rep. of Germany, and Piotr Sendor, Frankfurt am Main, Fed. Rep. of Germany, assignors to Karl-Heinz Schmall, Baden-Baden, Fed. Rep. of Germany

Filed Apr. 14, 1978, Ser. No. 896,377

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1977, 2716717; Apr. 30, 1977, 2719354

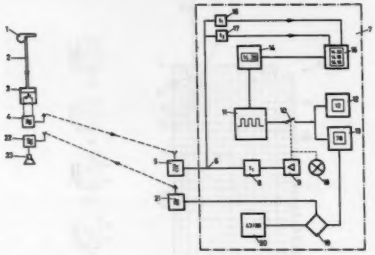
Int. Cl.² A63B 71/00

U.S. Cl. 272—3 **12 Claims**

9. A method for determining the effective playing time of a sporting team game, in which playing area signals emitted by a referee and interference signals emitted outside the playing area are both received by means of at least two mutually separate reception devices, said playing area signals and said interference signals are compared with one another, and the signals received from the playing area are used to interrupt and restart the time measurement, and those signals corresponding to

the separately received interference signals are identified and filtered out as interference signals.

10. An arrangement for determining the effective playing time of a sporting team game, which has a referee and a predetermined playing duration and in which interruptions of play are signalled by the referee by means of a whistle, comprising at least one time measurement device comprising an actuator input for interrupting and re-starting the measurement; a wireless signal receiver of which the output is connected to the actuator input; a portable transmitter for transmitting signals to



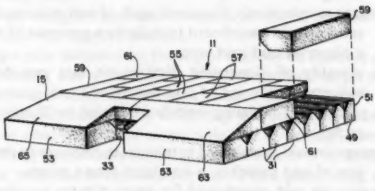
the receiver; and a switch device actuatable by the referee to activate the transmitter and to transmit signals to interrupt and re-start the time measurement at the beginning and end of each interruption of play, said receiver comprising at least one playing area reception conductor within the playing area for the reception of signals radiated by the transmitter, and wherein said portable transmitter device for wireless signal transmission emits at least two different signals and the receiver device includes at least one comparator arrangement for ascertaining a variation of such signals.

4,215,857

ATHLETE'S LANDING PIT

Donald W. Gordon, 2718 Standish, Anaheim, Calif. 92806

Filed Jan. 23, 1976, Ser. No. 651,674
Int. Cl.[3] A63B *5/18*
U.S. Cl. 272—101 **10 Claims**



8. An athlete's landing pit, comprising:

a plurality of independent foam blocks juxtaposed to form a cushioning layer, said blocks formed to provide a composite, contiguous planar upper foam surface for said cushioning layer, said blocks formed and shaped in cross section so that when so juxtaposed to form said layer, said plurality provides at least one longitudinally extending void extending horizontally within said cushioning layer; and

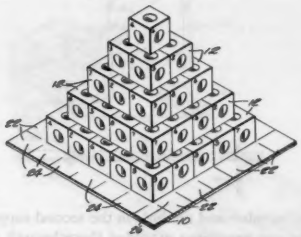
a fabric cover stretched over said cushioning layer to maintain the juxtaposition of said plural foam blocks.

4,215,858

GAME APPARATUS

Eric H. Olsen, 709 W. Auburn Ct., Mequon, Wis. 53092

Filed Apr. 24, 1978, Ser. No. 899,306
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 R **6 Claims**



4. Game apparatus comprising:

a playing board having a flat playing surface, means on said board dividing said playing surface into a plurality of delineated small areas for occupancy by playing blocks,

a plurality of cubical playing blocks arranged in a stacked layered pyramid arrangement on said playing board and including at least four layers of said blocks including a bottom layer, a pair of intermediate layers including an upper intermediate layer and a lower intermediate layer, said upper intermediate layer including four blocks, said lower intermediate layer supported by said bottom layer and positioned centrally thereon, each of said blocks of said lower intermediate layer supported by four blocks of said bottom layer, and a top block supported by each of said four blocks of the upper intermediate layer, and the arrangement of said blocks being such as to allow removal of some but not all of said blocks of said intermediate and bottom layers without causing collapse of other blocks, said blocks each having planar faces, each of said planar faces having a recess, and a thin member positioned in each recess and having a longitudinal axis generally parallel to the plane of an adjacent face, and said thin member generally bisecting said recess, and indicia on said blocks,

means for removing selected blocks from said pyramid formation, said removing means including a rod having a hook formed in one end, said hook receivable in said recess and engageable with said thin member, and

a pair of dice, one of said dice having an unnumbered surface, and the other of said dice having a pair of unnumbered surfaces.

4,215,859

CUE BRIDGE

Steven D. Charlton, 3511 Highway "D", West Bend, Wis. 53095

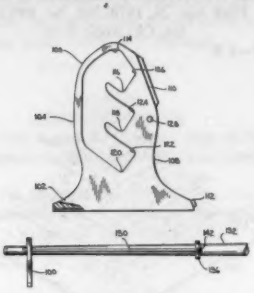
Filed Jul. 10, 1978, Ser. No. 923,158
Int. Cl.[2] A63D *15/10*
U.S. Cl. 273—23 **3 Claims**

1. A bridge comprising:

(a) a first support member having a base portion and concave sides, the curvature of said sides being such as to allow the base to extend under a cushion on a pool table when the bridge is in use, the first member having an aperture therein, the aperture having a plurality of steps formed therein, the steps being rests for a cue when a cue is extended through said aperture the cue being movable from step to step without removing it from the aperture;

(b) a rod, one end of which is attached to the first support member; a second member said second support member having a hole extending therethrough and being slidably attached to the other end of said rod, said second support member being attachable to a cue by extending said cue through said hole in said second member; and

(d) means for attaching said second support member to a cue after extending the cue through the aperture in the first



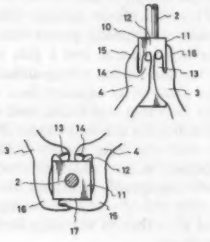
support member and the hole in the second support member, the cue remaining extended therethrough while the bridge is in use.

4,215,860

GOLFCLUB

Yoshiro Nakamatsu, 6-31-10, Shimouma, Setagaya-ku, Tokyo, Japan

Filed Nov. 9, 1976, Ser. No. 740,283
Claims priority, application Japan, May 20, 1976, 51-57188; Jun. 26, 1976, 51-74989
Int. Cl.[2] A63B *53/14*
U.S. Cl. 273—81 R **1 Claim**



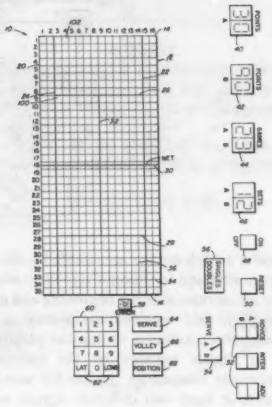
1. A golf club comprising a head having a striking face for striking a golf ball, a shaft extending from the head, said shaft having an outer surface of circular cross-section, gripping means on the shaft adapted to be gripped by a golfer's hands to swing the golf club, said gripping means consisting essentially of a square cross-section with four mutually perpendicular flat faces including top and bottom faces and two side faces, each of said top, bottom and side faces being parallel to the axis of the shaft and said side faces being generally parallel to the plane of the striking face of said head, said top face being gripped by the golfer's two thumbs such that the two thumbs are disposed side-by-side substantially parallel to one another and parallel to the plane of the striking face of the head, said bottom face being gripped by the other fingers of the golfer's hands transversely to the plane of the striking face and said side faces being engaged by the golfer's palms, whereby the golf club is swingable by a golfer as the golf club including the striking face passes in a direction perpendicular to the plane of the striking face through parallel planes parallel to the striking face at the point of contact of the striking face with the golf ball.

4,215,861

ELECTRONIC TENNIS GAME

Joseph J. Nemeth, 104 Providence Ave., Doylestown, Pa. 18901

Filed Nov. 29, 1978, Ser. No. 964,320
Int. Cl.[3] A63F *9/00*
U.S. Cl. 273—85 G **8 Claims**



1. An electronic apparatus for playing a simulated tennis game comprising:

a gameboard;

a rectangular tennis court area on said gameboard scaled to the dimensions of a regulation tennis court;

a plurality of equally spaced and visibly displayed longitudinal and lateral grid lines dividing said court area into a plurality of like rectangular grid areas;

coordinate markings along said grid lines to provide a unique identification of each of said rectangular areas in said grid, according to its row and column;

means to selectively illuminate each of said rectangular grid areas on said gameboard to indicate a presence of a ball or a player at said grid area;

a plurality of illuminated displays on said gameboard to indicate the scoring of said simulated tennis game;

a plurality of initiating switches adapted to illuminate said grids;

means on said gameboard to initiate, in response to the actuation of said switches, a simulated tennis game;

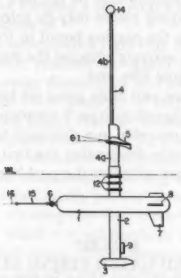
means on said gameboard for game players to select their desired player and ball positions while and when utilizing the grid area coordinates to indicate a ball or player at said positions;

a microcomputer system which and when actuated by said switches accepts inputs from said game initiating switches and from said keyboard and processes said inputs according to a simulated tennis game program to provide outputs in the form of illuminated rectangular grids on said gameboard to indicate respective player and ball positions in the game and to update said scoring displays when an error occurs and a point is scored.

4,215,862
WATER-SURFACE TOWED TARGET

Takashi Yoshikawa, Yokohama; Shigeru Kato, Kamakura; Akira Obata, Yokohama; Hiroshi Shibazaki, Yokosuka; Shigeaki Ishikawa, and Toshio Satoh, both of Yokohama, all of Japan, assignors to Japan Aircraft Mfg. Co., Ltd., Yokohama, Japan

Filed Jun. 21, 1978, Ser. No. 917,474
Claims priority, application Japan, Jun. 28, 1977, 52-84302[U]
Int. Cl.[2] A63B *71/02*
U.S. Cl. 273—350 13 Claims



1. A water-surface towed target comprising:

a towed member running substantially at a predetermined depth under the surface of the water when towed by a mother ship,

a ballast weight suspended under said towed member by means of a support member,

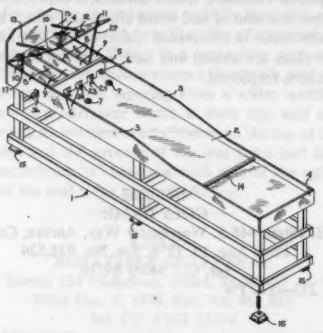
a target pole mounted on the top of said towed member and extending above the surface of the water, said target pole carrying a target at the upper portion thereof, and

a shaped stabilizing, spray deflecting and depth maintaining plate attached to said target pole and extending substantially symmetrically laterally outward from both sides of said pole, the lowermost portion of said plate being at a position a small distance above the waterline of said target pole when said towed member is substantially at the predetermined depth, the portions of said plate on opposite sides of said pole being generally equally spaced vertically above the surface of the water when said pole is vertical, said plate being attached to said target pole at an adjustable angle of incidence to the surface of the water for deflecting upwardly sprayed water downwardly for preventing water spray from affecting the target, for maintaining the depth of the submerged towed member substantially at a predetermined depth and for stabilizing the target by substantially preventing rolling of the target.

4,215,863
COIN OPERATED SLIDING PUCK GAME

Jerald W. Kuiper, 5949 Oak Lane Dr., Butte Des Mortes, Wis. 54927

Filed Aug. 23, 1978, Ser. No. 935,955
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—126 R 12 Claims

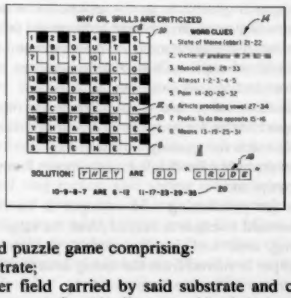


1. A game apparatus, comprising a supporting structure, a substantially horizontal playing surface mounted on the supporting structure and having a first end and a second end, a transverse and substantially vertically extending wall disposed adjacent the second end and having a series of transversely disposed openings extending from the playing surface, each of said openings being labeled to represent a predetermined score upon entry of a puck playing piece propelled from said first end, a compartment between said wall and said second end communicating with each opening to receive a puck propelled from said first end and passing through the openings, a cover mounted on the supporting structure above said compartment for movement between compartment open and closed positions, movable means mounted in each of said openings for movement with respect to the supporting structure and movable between an obstructing position and an unobstructed position, first connecting means operably connecting the cover and the movable means, whereby movement of the cover to an open position will move said obstructing means to the obstructing position, and second means connected to said movable means for movement thereof to said unobstructed position.

4,215,864
WORD PUZZLE GAME

David L. Nichols, 6705 N. 12th Pl., Phoenix, Ariz. 85014

Filed Aug. 2, 1978, Ser. No. 930,481
Int. Cl.[2] A63F *9/06*
U.S. Cl. 273—153 R 6 Claims



1. A word puzzle game comprising:

(a) a substrate;

(b) a letter field carried by said substrate and comprising letter spaces defined by lines on said substrate, each space

including an area containing a letter and means comprising subordinate spaces lined within said spaces in areas separate and distinct from said letter containing areas for indicating said spaces and associated letters have been used and thereby removed from further play;

(c) a set of word clues associated with and keyed to said letter field;

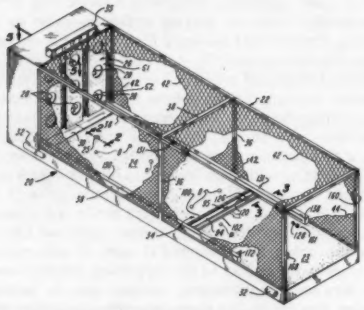
(d) a puzzle statement whose solution is dependent upon the proper solution of said word clues, and which is revealed by the letters in the unused spaces of said letter field when said clues are solved and said means for indicating used spaces is employed.

4,215,865

GOLF GAME

Oliver H. Pilati, 445 S. Worchester Way, Aurora, Colo. 80012

Filed Aug. 10, 1978, Ser. No. 932,526
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—176 FA **16 Claims**



1. A golf game comprising:

a base providing a fairway, a target area at one end of the fairway and a teeing area at the other end of the fairway opposite the target area;

a target arrangement in the target area including targets and means for stopping balls that strike or miss the targets for preventing the balls from being deflected back from the target area to the teeing area;

sensing means for sensing balls that strike a target;

means in the target area for collecting balls that are shot at the target area for return to the teeing area; and

means for sweeping balls from said fairway into said ball collecting means, said sweeping means including:

a support frame;

a sweeper mounted to said support frame and movable from a first position wherein balls on the fairway are not contacted by movement of said sweeper to a second position wherein balls on the fairway are contacted by movement of said sweeper;

wheels mounted to said support frame for supporting said support frame for movement along said fairway;

a guide track for guiding said wheels;

a drive assembly for driving said support frame along said fairway; and

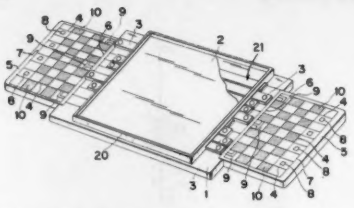
means for positioning said sweeper in its first position when said sweeper is moved from the target area to the teeing area and in the second position when said sweeper is moved from the teeing area to the target area whereby balls are contacted by said sweeper and pushed into said ball collecting means.

4,215,866

LINE CONNECTING TABLE GAME SET

Takeshi Shimizu, Yashioshi, Japan, assignor to Kabushikikaisha Anoa, Tokyo, Japan

Filed Dec. 14, 1978, Ser. No. 969,327
Claims priority, application Japan, Feb. 24, 1978, 52-22290[U]
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—275 **8 Claims**



1. A table game set comprising

two four sided playing boards having a plurality of adjacent rows of squares thereon, each said playing board having a goal line and start line disposed on opposite sides thereof;

a plurality of flat, square playing pieces each having a face and having a size equal to one of said squares on the playing board, said playing pieces having a plurality of different line configurations on the face thereof,

whereby the playing pieces may be selectively placed in the squares on the playing board to form a continuous line path from a square adjacent the start line to a square adjacent the goal line; and

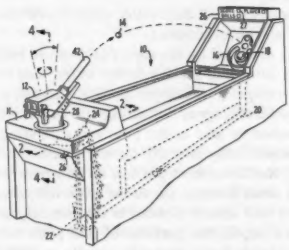
a means mounted on said table game set between said playing boards and aligned with each square adjacent said goal line, said means movable in a direction toward each goal line for respectively designating the first completion of a path to each square adjacent the goal line of each playing board.

4,215,867

TARGETS AND GATED FIRING GUNS FOR PROPELLING BALLS THERETO

Vernon R. Natwick, Saratoga, Calif., assignor to Ramtek Corporation, Santa Clara, Calif.

Division of Ser. No. 814,329, Jul. 11, 1979, abandoned. This application May 4, 1979, Ser. No. 35,821
Int. Cl.[3] F41B *11/00*
U.S. Cl. 273—357 **1 Claim**



1. An amusement game comprising a plurality of targets, balls and operator fired guns for shooting the balls toward the target, each of the guns having a trigger for controlling the firing rate of each such gun with each trigger operation causing the firing of a single ball and further having means which inhibits the operation of each such trigger in response to a control signal, means for automatically returning the balls from the targets to the guns, means for automatically loading one

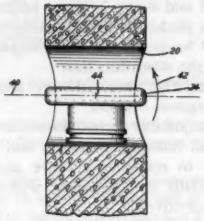
ball at a time into each gun for firing, and means for supplying a series of trigger inhibit control signals to said trigger operation inhibiting means of each gun to simultaneously and selectively gate the firing of all of the guns to thereby establish a maximum simultaneous firing rate for all of the guns.

4,215,868

GASKET APPARATUS AND METHOD

Harry W. Skinner, Fort Wayne, Ind., and Alan D. Burdick, Aurora, Ill., assignors to Press Seal Gasket Corporation, Fort Wayne, Ind.

Filed Aug. 23, 1978, Ser. No. 936,122
Int. Cl.[2] F16J *15/24*
U.S. Cl. 277—1 **8 Claims**



1. A method of forming a seal with a circular hole in a wall comprising the steps of

(a) inserting a substantially rigid ring into the end portion of an elastomeric resilient elongated sleeve thereby determining the outer diameter of said sleeve radially opposite said ring, the outer diameter of said sleeve with said ring inserted being larger than the diameter of said hole,

(b) force fitting said assembled ring and sleeve edgewise into said hole in a direction substantially parallel to the axis thereof with said assembled ring and sleeve lying in a plane also substantially parallel to said axis, and

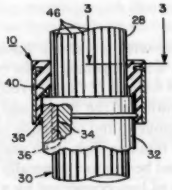
(c) forcefully rotating the thus force fitted assembly into a position in which it is substantially coaxial with said hole and with said sleeve being compressed between the wall of said hole and said ring thereby providing a seal.

4,215,869

SPLINED SHAFT SEAL ARTICLE AND APPARATUS

Darrell D. Pendleton, Gastonia, N.C., assignor to Garlock Inc., Longview, Tex.

Filed Apr. 16, 1979, Ser. No. 30,075
Int. Cl.[2] F16J *15/56*
U.S. Cl. 277—12 **36 Claims**



1. Apparatus comprising:

(a) a shaft having a splined end with a plurality of identical, circumferentially equally spaced-apart, radially outwardly extending spline teeth separated by a plurality of identical grooves;

(b) a housing having a bore therein and said splined end of said shaft extending into said bore for reciprocating movement therein;

(c) a seal mounted on said housing and in sealing contact with said splined end of said shaft;

(d) said seal comprising:

(1) a unitary molded elastomeric body;

(2) said seal including a mounting portion mounting said seal on said housing; and

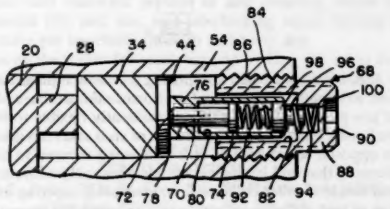
(3) said elastomeric body including an annular toothed seal portion having a plurality of identical, circumferentially equally spaced-apart, radially inwardly extending seal teeth separated by a plurality of identical grooves, each seal tooth fitting in a respective groove of said splined shaft in sealing contact therewith, said seal teeth having sidewalls tapering from a wider width at their base to a narrower width at their top, said seal teeth having an interference "y" between the top of the spline teeth and the groove of the seal teeth and having an interference "x" between each side of the spline teeth and the seal teeth, and $x \geqq 150\%$ y.

4,215,870

ROTATABLE SHAFT SEAL

Jesse W. Escue, 314 Nicholson, Joliet, Ill. 60435

Filed Dec. 4, 1978, Ser. No. 965,822
Int. Cl.[3] F16J *15/34*
U.S. Cl. 277—93 R **27 Claims**



1. A sealing assembly for effecting a sealing joint between relatively rotatable elements which include a stationary element and a rotatable shaft passing through said stationary element, comprising:

stationary seal means defining an annular sealing surface fixed on said stationary element and surrounding said shaft;

rotatable seal ring means surrounding said shaft and having an annular sealing surface for engaging and cooperating with said annular sealing surface of said stationary seal means to establish a seal therebetween;

a rotatable collar secured to said shaft for rotation therewith on the side of said rotatable seal ring means opposite said stationary seal means, said collar including a recess opening inwardly toward said seal ring means and an outwardly opening, exposed threaded bore which is axially co-extensive with said recess; and

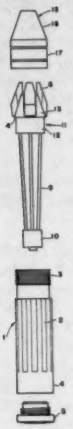
at least one adjustable spring assembly mounted on said collar for biasing said seal ring means against said stationary seal means to effect engagement of said cooperating annular sealing surfaces, said spring assembly including a plunger disposed in said recess in \said collar, a nut threaded into said bore in said collar and exposed outwardly thereof for threading adjustment in said bore, said nut including a recess opening toward said seal ring means, and spring means for biasing said plunger toward said seal ring means, said spring means being positioned within said recess in said nut and bearing at one end thereof against said plunger and at the other end thereof against said threaded nut on the inside of said recess, whereby threaded adjustment of said nut within said bore in said collar readily adjusts the biasing force of said spring means.

4,215,871

HAND HELD COLLET

Mordechai Hirsch, and Ilan Cohen, both of Nahariya, Israel, assignors to Vargus Ltd., Nahariya, Israel

Filed Mar. 5, 1979, Ser. No. 17,272
Int. Cl.³ B23B *31/12*
U.S. Cl. 279—48 **2 Claims**



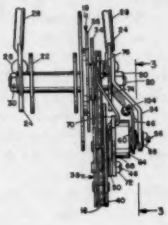
1. A hand held collet comprising a hollow tubular handle; a first, externally threaded end portion of said handle; a plurality of jaw pieces; a like plurality of resiliently flexible rods; a rod anchoring block to which a first set of ends said rods is secured, an opposite set of ends of said rods being secured to said jaw pieces so that said jaw pieces radiate outwardly with respect to said block; a collet collar; a first, apertured, tapering end portion of said collar; a second, opposite internally threaded end portion of said collar; said collet being assembled with said anchoring block and rods disposed within said handle and with said jaw pieces extending beyond the first end thereof into said collar, screw coupling of said collar to said handle resulting in the inward gripping, displacement of said jaw pieces against an outwardly directed biasing force exerted by said rods; an annular member surrounding said rods; and a plurality of fixed jaw pieces formed integrally with said member and respectively disposed between said first mentioned jaw pieces, a skirt portion of said member adapted to be located within said first end portion of said handle and an outwardly directed flange of said member adapted to abut a rim of said first end portion.

4,215,872

POSITIVE SHIFT DERAILLEUR MECHANISM

Marion A. Clark, 1683 Cheryl La., Tulare, Calif. 93274

Filed Feb. 7, 1979, Ser. No. 10,039
Int. Cl.³ B62M *9/12*; F16H *9/00*
U.S. Cl. 280—236 **1 Claim**



1. In a bicycle having a frame, a rear wheel with an axle mounted in said frame, a plurality of drive sprockets of different sizes coaxially mounted on said rear axle, a pedal actuated drive chain engaging one of said drive sprockets, a shift carriage having an idler sprocket and a coplanar tensioning sprocket on which said chain is retained, said idler sprocket having a shaft on which said shift carriage is pivotal, the improvement comprising:

a mounting plate to which said idler sprocket shaft is secured;

shift means including a post fixed on said frame with an axis parallel to the rear wheel axis;

a barrel coaxial with said post, said mounting plate being fixed to said barrel;

a sleeve rotatably mounted on said post and within said barrel, said sleeve having a radially extending arm;

said post and said sleeve having a helically threaded interconnection pitched in one direction, and said sleeve and said barrel having a helically threaded interconnection pitched in the other direction;

means connected between said barrel and said frame to hold the barrel against rotation;

a shift lever adjustably mounted on said frame; and

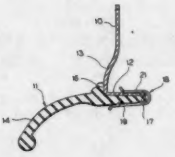
rigid push-pull linkage connecting said shift lever to said radial arm to rotate said sleeve and move said idler sprocket axially into alignment with each of said drive sprockets selectively.

4,215,873

METHOD AND MEANS FOR ATTACHING ACCESSORY FENDER TO AUTOMOTIVE VEHICLE

Harold Price, Glencoe, Ill., assignor to G-P Manufacturing Co., Inc., Chicago, Ill.

Filed Sep. 5, 1978, Ser. No. 939,172
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—153 R **3 Claims**

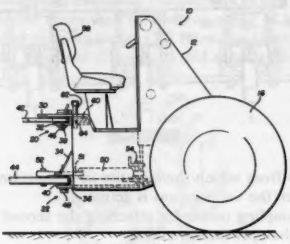


1. In combination with a vehicle having a lateral metal flange delineating a wheel opening in the body of the vehicle, an accessory fender formed of flexible resilient material comformable to the contour of the flange and having a marginal strip portion contiguous to the underside of said flange, and a plurality of resilient retainer clips, each said retainer clip being formed of spring steel bent into a generally U-shaped configuration having a pair of legs connected by a bight portion with one of said legs being longer than the other, and each leg having at least two teeth extending angularly outwardly of the plane of the leg and in the direction of the opposite leg, each retainer clip being adapted to be forcibly applied at spaced points to the marginal strip portion of said flange by applying force on the bight portion to drive the clip so that the teeth of one leg engage in the metal flange and the teeth of the other leg engage in the marginal strip portion so as to secure said accessory fender to said flange.

4,215,874
ARTICULATION LOCK

James E. Schoelkopf, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 18, 1978, Ser. No. 970,418
Int. Cl.[3] B62D *13/00*
U.S. Cl. 280—474 1 Claim



1. An articulation locking arrangement for locking the pivot connection between first and second frames of an articulated machine;

said pivot connection including at least one pair of pivot plates mounted on said first frame and at least one pivot plate mounted on said second frame and a pivot pin interconnecting said pivot plates for permitting pivotal movement by said frames about a vertical axis, said pivot plates and pivot pin forming an upper pivot joint between said frames;

an articulation locking plate extending from said pivot plate on said second frame and said locking plate extending in the plane of said pivot plate on said second frame, said articulation locking plate being sector-shaped and said locking plate having an arcuate end portion and a plurality of arcuate recesses along said arcuate end portion for locking said machine in straight-ahead, maximum right, and maximum left positions;

an operator's station being mounted on said machine above said pivot joint, said operator's station including an operator's seat and floor;

said pivot plates on said first frame and said floor of said operator's station having vertically aligned locking openings and vertically aligned storage openings spaced from said locking openings, said locking openings being proximate said operator's seat and said storage openings being spaced radially outwardly from said locking openings, and a locking pin being normally stored in said storage openings; and

said locking plate being swingable between said pair of pivot plates on said first frame as said machine articulates and a selected one of said plurality of locking recesses in said locking plate becoming vertically aligned and registerable with said locking openings such that said locking pin may be removed by an operator from said storage openings and inserted through said locking openings and said selected locking recess in said locking plate to thereby selectively lock said pivot connection in a fixed position without the operator leaving the operator's seat, and said arcuate recesses in said locking plate being open-ended for permitting said locking pin to pass through said locking plate without binding.

4,215,875
TRAILER HITCH

Dwen R. Younger, 2181 Lone Oak Ave., Napa, Calif. 94558

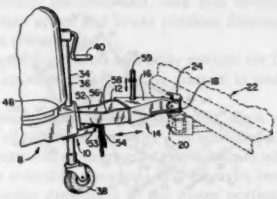
Filed Oct. 31, 1978, Ser. No. 956,154
Int. Cl.[2] B60D *1/16*
U.S. Cl. 280—478 B 6 Claims

1. An apparatus for attaching a trailer to a towing vehicle which comprises:

means on the front end of the trailer defining a horizontally-oriented forwardly diverging slot of a first vertical thickness;

means for coupling the trailer to the towing vehicle, said coupling means having a bore therethrough, a rearward portion configured for insertion into said slot and for mating with said means defining said forwardly diverging slot, and a forward portion for attachment to the towing vehicle;

a segment of the rearwardly extending portion of said coupling means having a second vertical thickness substantially less than the first vertical thickness of said slot so that said coupling means can be moved vertically within said slot to facilitate attachment of the forward portion of said coupling means with the towing vehicle;



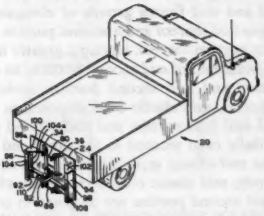
means for interlocking said coupling means and the trailer when said rearward portion of said coupling means is inserted into said slot, said interlocking means having a locking pin insertable through said bore; and

means on the trailer for receiving said locking pin when the rearwardly convering portion of said coupling means is inserted into said slot.

4,215,876
TRAILER HITCH

Donald E. Jacks, 2826 W. Cook Rd., Ft. Wayne, Ind. 46808

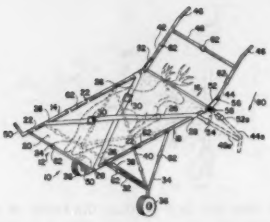
Filed Sep. 27, 1978, Ser. No. 946,418
Int. Cl.[2] B60D *7/00*
U.S. Cl. 280—483 6 Claims



1. Vehicle hitch apparatus for connecting a towed vehicle to a towing vehicle comprising an upright flat support member adapted to be affixed to the rear of the towing vehicle, a pair of horizontally spaced vertical guides secured to said member, a slide plate vertically slidably received by said guides, an elongated tongue secured at one end to said plate and extending horizontally rearwardly therefrom, a towed vehicle attachment member secured to said tongue distally from said plate, spring means operatively carried by said support member for resiliently supporting said tongue for movement vertically, said spring means including a leaf spring having a base leaf and a plurality of removable superposed leaves, a pair of vertical horizontally spaced elongated angle brackets affixed to said support member, said brackets projecting rearwardly from said support member and having a plurality of vertically spaced openings with a pair of mounting pins selectively received thereby for vertical adjustment, respectively, a pair of shackle plates provided with mounting openings and which are pivot-

ally connected to said brackets by means of said pins, respectively, and said base leaf being pivotally connected at its opposite ends to said shackle plates, respectively.

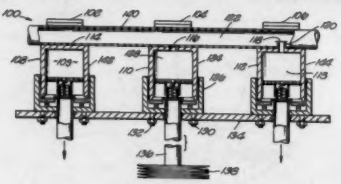
4,215,877
FOLDING UTILITY CART
George Pritchett, Rte. 4, Box 61A, Gilmer, Tex. 75644
Filed May 12, 1978, Ser. No. 905,159
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—652 9 Claims



1. A folding utility cart comprising a first group of elongated members forming a rectangular open frame, a flexible sheet, said flexible sheet secured to said first group of elongated members, a second group of elongated members, said second group of elongated members each being pivotably secured at one end thereof to one side of said open frame, a first wheel, said first wheel being journalled to the other end of said second group of elongated members, a third group of elongated members, one end of each of said third group of elongated members being pivotably secured to the other side of said open frame, a second wheel, said second wheel being journalled to the other end of each of said third group of elongated members, a fourth group of elongated members disposed forming a handle frame, said handle frame being angularly adjustably connected to one end of said open frame, each of said elongated members of said first group and said second group and said third group and said fourth group of elongated members having portions thereof elastically joined together, each of said first and said second and said third and said fourth groups of elongated members having a first portion thereof and a second portion thereof, one end of said first portion thereof, having a greater inside diameter than an adjacent end of said second portion, an elastic cord, said first portion and said second portion having a hollow passageway therein, said elastic cord disposed in said hollow passageway of said first portion and said second portion, the ends of said elastic cord secured to the other end of said first portion and the end of said second portion opposite said adjacent end, whereby said elastic cord is tensioned when said first portion and said second portion are disposed in coaxial alignment having said adjacent end residing in said one end.

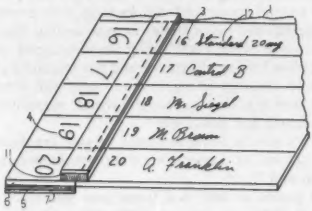
4,215,878
BUMPER-AIR BAG
Farrokh Hirbod, 149 N. Rexford Dr., Beverly Hills, Calif. 90210
Filed May 8, 1978, Ser. No. 904,134
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—737 14 Claims

1. A bumper-air bag system for inflating at least one air bag in a vehicle having a rigid frame upon releasing a quantity of compressed gas, said system comprising:
bumper means;
non-destructive mechanically actuated valve means adapted to be actuated in response to movement of the bumper means for releasing the quantity of compressed gas therethrough; and,
means defining a passageway for directing the compressed gas released through the valve means to the at least one air bag;
said valve means comprising:
a first member fixed to the rigid frame;
a second member movable relative to the first member in response to compression of the bumper means, the first member and the second member defining a valve enclosure from which the quantity of compressed gas flows when the valve means is actuated;



first coupling means for attaching the second member to the bumper means; and,
second coupling means for attaching the first member to the passageway means.

4,215,879
LABEL SYSTEM FOR IDENTIFYING ITEMS
Alvin S. Blum, 2350 Del Mar Pl., Fort Lauderdale, Fla. 33301
Filed Jan. 15, 1979, Ser. No. 3,355
Int. Cl.[2] G09F *3/04*
U.S. Cl. 283—21 11 Claims



1. Means for identifying a plurality of items comprising: support web means having a series of individual spaces for indicia and the like related to individual items; a plurality of adhesive labels each having a first surface coated with adhesive and a second, opposite surface for indicia corresponding or related to indicia on said support web means, said labels being releasably fastened to said support web means by releasable fastening means at other than said first adhesive coated surfaces, with the plurality of first adhesive coated surfaces being protected by common protection means and exposable by removal of said common protection means in a single operation, thereby preparing said labels for affixing to items while said labels remain releasably fastened to said support web means; and means for releasing said labels from said support web means after affixing to items.

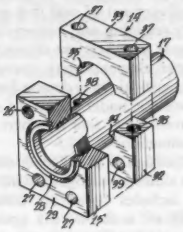
4,215,880
TUBE CLAMP
Jack H. Trittipoe, Elwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 6, 1978, Ser. No. 958,456
Int. Cl.[2] F16L *3/10*
U.S. Cl. 285—61 12 Claims

1. A fitting (11) for connecting a tube (17) in fluid flow communication with a hose end (13) having a distal collar (12) provided with a plurality of through holes (19 and 20) extending substantially parallel to the hose end axis, said fitting comprising:

an annular flange (15) having a central bore (21) having the distal end (25) of the tube positioned therein, said bore having at least one annular groove (24) having a radially expanded portion of said tube end positioned therein, said flange having a threaded hole (26) and a through hole;

an annular clamp (16) extending about said tube end and axially outwardly from said flange, said clamp including a first clamp half (32) having a first hole (39) and a pair of second holes (38) extending transversely to said first hole, and a second clamp half (33) having a pair of holes (37);

first threaded securing means (31) extending through one of said collar holes and threaded to said annular flange in said



threaded hole and securing a first portion of said flange substantially coaxially to said collar;

second threaded securing means (40) extending through another of said collar holes, said flange through hole, and said first clamp half first hole securing said first clamp half and a second portion of said flange substantially coaxially to said collar and maintaining said annular clamp (16) in abutment with said flange; and

a pair of third threaded securing means (36) extending each through a respective pair of holes of said clamp halves and securing the clamp halves in clamped relationship to said tube end and aligning a common surface of both clamp halves in a common plane for abutting said flange.

4,215,881

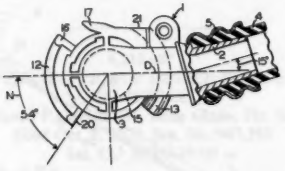
HOSE COUPLING

Daniel G. Scott, Wilkinburg, and William K. Mong, N. Huntingdon, both of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Dec. 26, 1978, Ser. No. 973,348

Int. Cl.[2] F16L *35/00*; B60D *1/08*

U.S. Cl. 285—68 **4 Claims**



1. An improved brake hose coupling for use with a railway vehicle brake hose to be coupled with a counterpart hose coupling of a counterpart brake hose of an adjacent vehicle, each of said hose couplings comprising:

(a) a hollow body portion having an opening therein for registering with a complementary opening in the counterpart hose coupling;

(b) a nipple portion joined to said body portion in an angularly offset relationship thereto and communicable with said opening through the hollow body portion;

(c) said body portion having an arcuate groove formed thereon between said opening and said nipple portion, peripherally adjacent and in concentric relation to said opening, and transversely to the axis of the coupling, said axis dividing said groove into an upper portion and a lower portion disposed on opposite sides thereof;

(d) an arcuate lip portion formed on said body portion peripherally adjacent and in concentric relation to said opening, diametrally opposite said arcuate groove, and transversely to the axis of the coupling for rotatably engaging the arcuate groove of the counterpart hose coupling, and vice versa, for retaining the two hose couplings in coupled relationship upon a certain amount of relative rotation in one direction therebetween, said axis dividing said lip portion into upper and lower portions disposed on opposite sides thereof; and

(e) stop means formed on said body portion for limiting said relative rotation to said certain amount in said one direction,

(f) said hose couplings being operable, upon said certain amount of relative rotation in a direction opposite to said one direction to an uncoupled disposition in which said lip portions rotatably disengage said grooves, respectively,

(g) the angular dimension of the upper portion of said lip portion being up to a maximum of 47° 30', and the angular dimension of the lower portion of said lip being 54°.

4,215,882

JOINT STRUCTURE

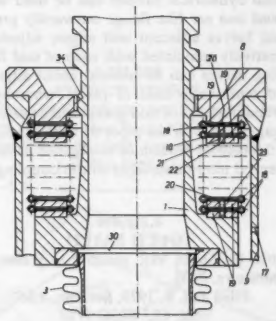
Toivo Bosch, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Mar. 30, 1978, Ser. No. 891,721

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714830

Int. Cl.[2] F16L *27/00, 51/02*

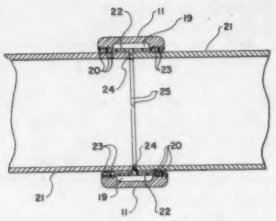
U.S. Cl. 285—227 **8 Claims**



1. A joint structure for interconnecting one end of a first pipe to the adjacent end of a second pipe, comprising intermediate connector means, said intermediate connector means comprising a plurality of resiliently deflectable liquid filled force transmitting units, each of said force transmitting units having first and second functional ends, said first functional ends being operatively connected to said one end of said first pipe and said second functional ends being operatively connected to said adjacent end of said second pipe, said resiliently deflectable liquid filled force transmitting units being effective to undergo resilient deflection thereby allowing said first and second pipes to undergo angular motion with respect to each other, each of said units comprises an annular pressure cushion, said annular pressure cushions being axially spaced from each other, a plurality of intermediate spacer rings, said spacer rings being interleaved between adjacent ones of said annular pressure cushions, each annular pressure cushion being provided with a bore for use in filling the pressure cushion with said liquid, a passage formed in an adjacent said intermediate spacer ring, said bore and said passage being in registry with each other,

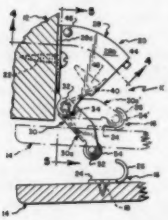
and said passage being closeable after filling the pressure cushion with said liquid.

4,215,883
COUPLING FOR PIPES AND FITTINGS
Theodore C. Brown, Sr., 601 Beaver Dam Rd., Raleigh, N.C. 27607
Filed Apr. 11, 1979, Ser. No. 29,283
Int. Cl.[3] F16L *21/06*
U.S. Cl. 285—236 **5 Claims**



1. A pipe and fixture type coupling comprising: a pair of symmetrical, generally semi-circular coupling halves having abutting edges, said edges being unidirectionally beveled to lie juxtaposed to each other; a cavity provided in each of said halves which is open to the central interior circumference thereof whereby pipes and fixtures with beaded ends can be joined as readily as plain pipes and fixtures without the requirement of special adapters; a plurality of bead like sealing ridges disposed on the outer interior circumference on each side of said cavity whereby a plain, sleeve-like gasket having a constant external cylindrical surface can be used with said coupling; at least one ear like flange outwardly projecting from each of said halves adjacent said edges; adjustable securing means operatively associated with each of said flanges so that said coupling halves can be secured about adjacent pipes or fittings and tensionally held in place. whereby said ridges engage the end portions of said gasket and press the gasket into sealing engagement with the pipes or fittings, and the external surface of the central portion of said gasket is radially spaced from the central interior surfaces of the coupling halves.

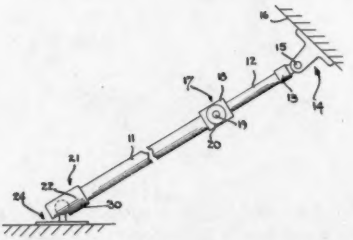
4,215,884
TOUCH LATCH
Carl H. Little, St. Louis, Mo., assignor to Weber-Knapp Company, Jamestown, N.Y.
Filed Jan. 8, 1979, Ser. No. 1,867
Int. Cl.[2] E05C *3/14*
U.S. Cl. 292—220 **4 Claims**



1. In a touch latch mechanism of the type adapted for use in latching a pair of members upon relative convergent movement thereof from a remote position into an adjacent position and for releasing said members from said adjacent position for relative divergent movement towards said remote position upon further movement of said members in the direction of said converging movement beyond said adjacent position, said touch latch mechanism including a catch plate carried by one of said members, and a keeper mechanism carried on the other of said members, said keeper mechanism including a housing fixed to said other of said members, a keeper element mounted in said housing for pivotal movement about an axis and having first and second end portions, said first end portion being engageable with said catch plate during said converging movement of said members, a spring subject to resilient deformation as said keeper element is pivoted upon engagement with said catch plate, and a latching device arranged in said housing for engagement with said second end portion of said keeper element upon pivotal movement thereof from an unlatched position incident to engagement of said first end with said catch plate for releasably retaining said keeper element in a latched position wherein said members are disposed in said adjacent position, said keeper element being movable into a release position relative to said latching device for return movement to said unlatched position under the bias of said spring incident to said further movement of said members, the improvement comprising in combination:

said second end portion of said keeper element is resiliently deformable in a direction aligned with said axis; and said latch device includes forwardly converging cam and clearance surfaces, a rearwardly opening notch and a rearwardly disposed abutment portion having a forwardly projecting stop generally aligned with said notch, said second end portion being disposed forwardly of said latch device and in alignment with said cam surface when in said unlatched position and being resiliently deformed incident to movement thereof rearwardly along said cam surface during latch plate induced pivotal movements of said keeper element, said second end portion tending to move between rearwardly disposed ends of said cam and clearance surfaces under its own bias, said stop constraining said second end portion for movement into said notch during movement of said second end portion between said rearwardly disposed ends to define said latched position, and said second end portion being moved out of said notch upon said further movement of said members to assume said release position permitting said spring to return said second end portion to said unlatched position.

4,215,885
PIVOTABLE HATCH ADJUSTER
Robert J. McCray, 1789 Pitcairn Dr., Costa Mesa, Calif. 92626
Filed Jul. 14, 1978, Ser. No. 924,494
Int. Cl.[3] E05C *17/30*
U.S. Cl. 292—338 **1 Claim**



1. An improved hatch adjuster having a tube within which a rod is telescopically received wherein the outer end of the tube is adapted for pivotal connection and the outer end of the rod a rotatable connection including a set screw for jamming the rod in desired position within the tube to provide adjustable alignment and support for a raised hatch cover, the improvement comprising:

a generally cylindrical socket member having a first bore connected to the outer end of said tube, a second bore

extending into a side portion of the socket member having an inner end shaped into a hemispherical bearing surface, and a third bore of lesser diameter extending internally in alignment with the first bore for communication with the second bore,

a ball member mounted within said second bore having a bearing surface adapted for pivotal movement in registry with the bearing surface of said bore,

a mounting bracket having one end of an upright stem connected to the ball member, and

a retaining screw for providing a restricted passageway so as to prevent the separation of said ball member from pivotal contact with said bearing surface of said second bore, the retaining screw being threadedly engaged in the third bore and having a round end portion projecting into said second bore in direct bearing with the lower surface of said ball adjacent to the connection with the stem of said bracket, whereby said ball is urged in pivotal contact with the bearing surface of said second bore.

4,215,886

ANIMAL LITTER COLLECTOR

Iraj Naderi, and Mahboobeh Naderi, both of 1865 211th St., Bayside, N.Y. 11360

Filed Aug. 21, 1978, Ser. No. 935,289
Int. Cl.[2] A47I *13/52*
U.S. Cl. 294—1 B **2 Claims**

1. A disposable animal litter collector, comprising:

a shovel-type scoop having a flat, supporting surface with a leading edge defining the opening of the scoop, vertical sidewalls on each side of the supporting surface, and a back wall joining the vertical sidewalls, said scoop including triangularly-shaped tabs secured to opposite sidewalls of said scoop, said tabs being directed toward each other and overlapping, and means for securing said tabs together to define said back wall of the scoop, and said supporting surface tapering inwardly from its leading edge;

a flexible bag having an opening at one end and closed at its opposite end, said bag additionally comprising a seam surrounding its open end, and a pair of drawstrings slidably disposed in said seam;

means for joining said scoop and the closed end of the bag together comprising a seam formed in said bag and secured to the back edge of said scoop; and

a scraper.

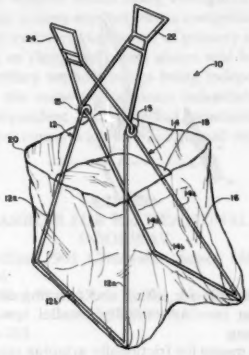
4,215,887

HAND OPERATED PICKUP DEVICE FOR DEPOSITED MATERIAL

Vernie A. Boots, P.O. Box 456, Belle Glade, Fla. 33430

Filed Oct. 2, 1978, Ser. No. 947,393
Int. Cl.[3] A01K *29/00*
U.S. Cl. 294—1 BA **3 Claims**

1. A pickup device particularly adapted for use with a small inverted bag, said device having first and second loops of generally U-shaped configuration, with the base portion of each loop being essentially flat, and with an upstanding leg located at each end of each base portion, each pair of legs extending upwardly so as to form a handle, with the legs of one U-shaped member being hinged with the legs of the other U-shaped member at a location between the base portions and the handles, such that when the handles are grasped and brought together by the user, the base portions of the U-shaped members will be brought together, said loops being adapted to receive an inverted bag turned partially inside out, said device then being adapted to be placed over material to be picked up, with the open portion of the inverted bag being disposed directly over the material, said handles, when brought together by the user, causing the base portions of the loops to be brought together so as to separate the material from the floor or sidewalk upon which it rests, with this action serving to



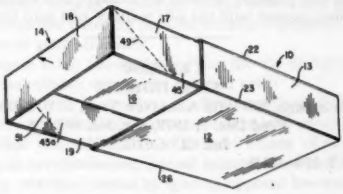
entrap the material inside the bag, said first loop being larger than said second loop, with said second loop being adapted to pass through said first loop at the time handles are brought together, with such serving to effect a closure of the bag, so that the contents will not be inadvertently spilled.

4,215,888

PICK-UP DEVICE

Douglas L. Gavin, 49 E. 12th St., and Edward E. Parmelee, 33 St. Marks Pl., both of New York, N.Y. 10003

Filed Nov. 20, 1978, Ser. No. 962,006
Int. Cl.[2] A47I *13/52*
U.S. Cl. 294—1 B **1 Claim**

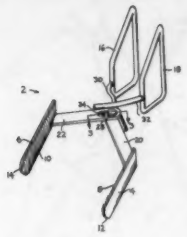


1. A pick-up device comprising:

a hollow sleeve having a bottom wall, a pair of side walls and a top wall and being open at both of its ends; and

a scraper tray insertable into said sleeve at the front end and movable back and forth between an open position extending outside the sleeve and a closed position within the sleeve, said tray having a base wall, a first upstanding side wall connected thereto and defining a continuous peripheral rim, said first side wall substantially closing the front end of said sleeve when said tray is in its closed position, and a second side wall adapted to close the other end of said sleeve when said tray is in its closed position, said tray being adapted to be placed in a rim-down position over an object when said tray is in its open position and thereafter closed to scrape and carry the object into the sleeve.

4,215,889
LIFTING TOOL
Lloyd M. Rayburn, 1643 Rayburn Rd., Ashland, Ky. 41101
Filed Mar. 2, 1979, Ser. No. 16,823
Int. Cl.³ B65G 7/12; B66C 1/44
U.S. Cl. 294—16 **13 Claims**



1. A tool suitable for lifting and carrying an auto battery having at least two substantially parallel spaced-apart side walls comprising:

(a) gripping means for frictionally gripping said side walls of said auto battery, said gripping means including at least two opposed gripping surfaces positionable in a substantially parallel spaced-apart configuration in which configuration said opposed gripping surfaces are spaced-apart by a distance greater than the width of said auto battery, said auto battery being receivable between said opposed gripping surfaces;

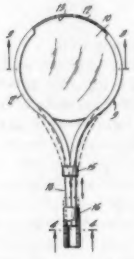
(b) handle means for manually grasping said tool, each of said gripping means having a respective handle means connected therewith;

(c) lever means for connecting said gripping means with said handle means;

(d) pivot means for pivotally connecting said lever means;

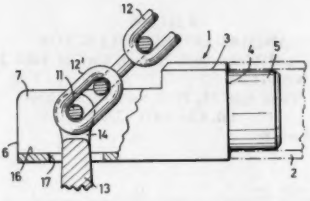
(e) adjustment means slidably connected to said pivot means for slidably adjusting the separation between said at least two gripping surfaces, said at least two gripping surfaces being maintainable in substantially parallel spaced-apart configuration during said adjustment, said handle means, lever means, gripping means, pivot means, and adjustment means cooperating to cause said gripping surfaces to adjust into a substantially parallel spaced-apart configuration as said gripping surfaces are brought into frictional gripping contact with the side walls of said auto battery.

4,215,890
LENS HOLDER
Milton Savage, 500 Fifth Ave., New York, N.Y. 10036
Filed Dec. 7, 1978, Ser. No. 967,124
Int. Cl.³ G02B 7/02
U.S. Cl. 294—31.2 **2 Claims**



1. An adjustable lens holder comprising a flexible loop shaped frame, formed of a continous strip of material, free end portions on said frame forming a straight shank, an elongated groove within said looped frame to receive a lens, a tubular handle to receive the free ends of said loop shaped frame, and a tightening sleeve slidably mounted on said frame shank above said handle to lock a lens within the elongated groove.

4,215,891
SLING MOUNTING HEAD
Alfred Thiele, Am Tyrol 17c, 5860 Iserlohn, Fed. Rep. of Germany
Filed Oct. 2, 1978, Ser. No. 947,747
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1977, 2745649
Int. Cl.² B66C 1/12
U.S. Cl. 294—74 **11 Claims**

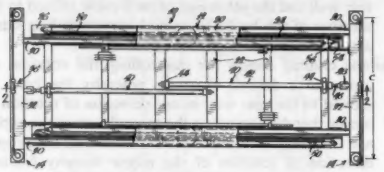


1. A sling mounting head for use with a spacer element and mounting two members of a sling chain one of which members is a suspension member of a predetermined transverse dimension and has a fork head including two arms, whereas the other of these members is a sling chain link member arranged to be received between the arms of the fork head of the suspension member, the sling mounting head comprising a body portion having a central section with an axis and two axially spaced opposite faces, a first end section extending from one face of said central section in one axial direction and arranged to releasably retain the spacing element, and a box-shaped second end section including two side walls and a bottom wall extending from the other face of said central section in opposite axial direction, said side walls of said second end section being formed as forked plates which are substantially parallel to and spaced from one another by such a distance that they form a gap therebetween in which the suspension member is received, said bottom wall of said second end section having an opening through which one of the two members extends, said central section, said first end section, and said side and bottom wall of said second end section together forming an integral member; and means for connecting the two members with one another and retaining them in said body portion, and mounted in said side walls of said second end section of said body portion.

4,215,892
LATCHING MECHANISM FOR SPREADER
William K. Holmes, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.
Filed Oct. 2, 1978, Ser. No. 947,550
Int. Cl.² B66C 1/66
U.S. Cl. 294—815 F **12 Claims**

1. A top lift cargo container lifting frame with four corners each having a latching mechanism attached thereto, each latching mechanism including an elongated shank having locking lugs at one end thereof, a locator member surrounding said shank adjacent said locking lugs, and mounting means on said frame for said shank, said mounting means accommodating (1) universal movement of said shank about a fixed point on said

frame and (2) axial movement of said shank with respect to said fixed point on said frame, said locator member cooperating



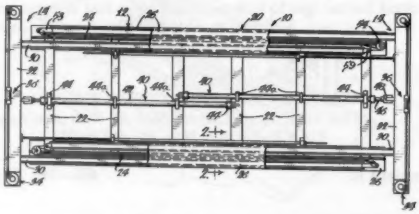
with said frame to limit axial movement of said shank on said frame.

4,215,893

SYNCHRONIZED EXPANDABLE SPREADER

William K. Holmes, Rothschild, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 2, 1978, Ser. No. 947,551
Int. Cl.[2] B66C *1/66*
U.S. Cl. 294—81 SF **9 Claims**



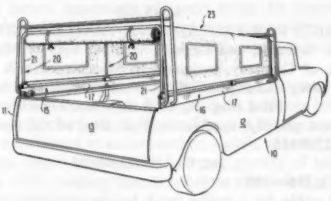
1. An extensible spreader comprising an elongated base section and first and second extensible members extending from opposite ends of said base section, independent drive means for moving each of said extensible members on said base section, and synchronizing means between said base section and each of said extensible members for controlling movement of each of said extensible members with respect to said base section to produce equal increments of movement of both of said extensible members in response to operation of said drive means.

4,215,894

DEMOUNTABLE ASSEMBLY FOR ATTACHING A CAMPER BODY AND LOAD CARRIER TO A PICKUP BODY

Bruce C. Sidlinger, P.O. Box 40002, Garland, Tex. 75040

Filed Jan. 27, 1978, Ser. No. 872,996
Int. Cl.[2] B60P *3/00*
U.S. Cl. 296—3 **16 Claims**



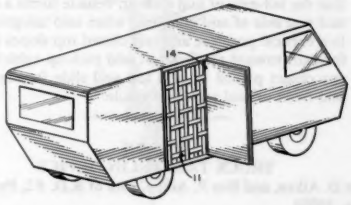
1. In an accessory for a vehicle having a rectangular body provided with at least two pairs of vertical stake sockets located on the respective opposite sides thereof, the combination including a pair of primary support means, secondary support means and tertiary support means, each of said pair of primary support means being elongated to be removably mounted in a pair of said stake sockets along a respective opposite side of the body, said primary support means being provided with two separate independent mounting means to alternatively demountably receive said secondary and tertiary support means, said secondary support means being configured to support a canopy top, said tertiary support means comprising at least one horizontal rack transverse to the pair of primary support means for supporting an elongated object above said body, said secondary and tertiary support means being independently connectable with the respective separate independent mounting means for independent mounting and demounting from the primary support means while in place in said stake sockets.

4,215,895

SAFETY BARRIER FOR RECREATIONAL VEHICLE DOORWAY

Albert J. Phillips, 7901 Clearwater, Space 148, Kennewick, Wash. 99336

Filed Mar. 19, 1979, Ser. No. 21,629
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—202 **1 Claim**



1. A safety barrier for the doorway of a recreational vehicle comprising, in combination:

a flexible barrier net of configuration similar to and size slightly greater than a recreational vehicle doorway to be serviced, the barrier net having spacedly aligned in parallel rows along the side edges thereof

plural fasteners each having a thinner body portion with means of attachment to the barrier net and extending laterally outwardly from the barrier net to carry thicker lateralmost fastening portions slidably engagable within lateral guide channels;

an elongate roller fastenably carrying the top of the barrier net and rollably storing the net, said roller

being rotatable against bias to allow unrolling of the barrier net, maintainable at a pre-determined partially unrolled position, and re-rollable by reason of said bias upon pre-determined manual manipulation, and

being rotatably carried by spacing opposed brackets supported on a recreational vehicle somewhat above and laterally of a doorway to be serviced to position the barrier net for potential extension over the doorway therebelow; and

paired opposed lateral guide channels carried by a recreational vehicle parallel to each other and at a spaced distance outwardly adjacent the vertical peripheral sides of a recreational vehicle doorway to be serviced to accept the barrier net therebetween,

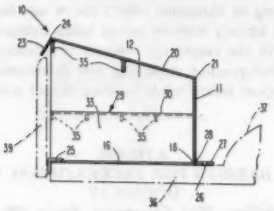
said lateral guide channels each having a rigid body defining parallel elongate fastener channels extending the length thereof, each fastening channel having an inner larger body portion communicating with smaller outer portion in turn communicating with the surface of the guide body facing the doorway to be serviced, to slidably receive and maintain fasteners carried by the sides of the barrier net.

4,215,896

BOX FOR A PICK-UP VEHICLE

Morris J. Drouin, 643 N. Evergreen Ave., Woodbury, N.J. 08096

Filed Mar. 27, 1978, Ser. No. 890,404
Int. Cl.[2] B60R *7/00*
U.S. Cl. 296—24 R **8 Claims**



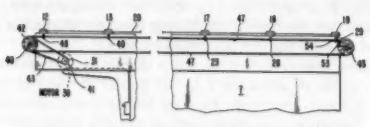
1. A box in combination with a pick-up vehicle comprising:
container having two closed sides, a closed front, a closed top, an open rear side, means for attaching said container to the rear portion of the bed of said pick-up vehicle so that the tail-gate of said pick-up vehicle forms a closure of said rear side of said container when said tail-gate is raised to a vertical position, and said closed top slopes down and forward toward the front of said pick-up vehicle, so that any object placed on said top will slide forward toward said front of said pick-up vehicle.

4,215,897

TRUCK TARPAULIN DEVICE

John D. Aiken, and Ben P. Aiken, both of R.D. #2, Portersville, Pa. 16051

Filed Jun. 9, 1978, Ser. No. 913,958
Int. Cl.[2] B60P *7/04*
U.S. Cl. 296—100 **1 Claim**



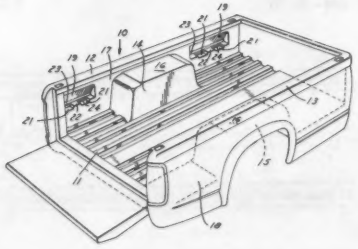
1. A truck tarpaulin device for a truck having a cargo space defined by a bed, a front wall, a back wall substantially parallel to the front wall and a pair of spaced parallel side walls substantially perpendicular to the front and back walls and extending substantially perpendicularly from the bed and having tops, said truck tarpaulin device comprising
a plurality of slats positioned atop the side walls and extending therebetween in substantially parallel relation to the front and back walls and supporting a tarpaulin affixed to the truck at the top of the front wall of the cargo space, said slats including a front slat and a back slat, each of the slats having spaced opposite ends at the opposite side walls and a pair of eye members each at a corresponding end of each slat;
a reversible electric motor having a shaft;
a front shaft rotatably mounted atop the front wall and extending parallel thereto and coupled to the shaft of the motor whereby the front shaft is rotatable by the motor in opposite directions;
a pair of front pulley wheels affixed to the opposite ends of the front shaft and rotatable therewith, said front pulley wheels being at the opposite side walls;
a pair of rear pulley wheels rotatably affixed to the opposite side walls at the back wall;
a pair of cables each extending around the front and rear pulley wheels of a corresponding side wall of the truck and extending through the eye members of the slats at said corresponding side wall with one end of each cable affixed to the eye member of the back slat at said corresponding side wall and the other end of each cable affixed to the eye member of the back slat at said corresponding side wall; and
motor control means for controlling the rotation of the motor in a desired direction whereby the back slat is moved to the rear wall in one direction of rotation of the motor thereby extending the tarpaulin over the entire bed and the back slat is moved to the front wall in the opposite direction of rotation of the motor thereby folding the tarpaulin.

4,215,898

PICK-UP BOX CONSTRUCTION

George Ulics, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1979, Ser. No. 15,532
Int. Cl.[3] B62D *25/20*
U.S. Cl. 296—183 **5 Claims**



1. In a pick-up truck having a cargo box,
the cargo box having a floor,
side walls extending upwardly from the floor,
and wheel housings having flat surfaces at the top thereof,
the wheel housings projecting upwardly from the floor a substantially equal distance and laterally protruding from the side walls into the cargo area of the cargo box,
the improvement comprising a plurality of recesses formed in each side wall of the cargo box,
each recess having a platform surface receiving a removable support member laterally spanning the cargo area between the side walls of the cargo box,
the vertical height above the floor of the platform surface of each recess being less than the vertical height above the floor of the wheel housing flat surfaces so that the upper surface of each support member will be substantially coplanar with the upper surface of each wheel housing.

4,215,899

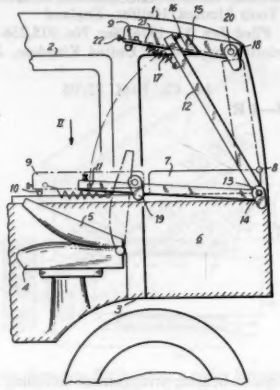
CABIN FOR TRUCKS WITH TRAILER-FIXTURES

Werner Schmidt, and Gerhard Watzek, both of Munich, Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Aug. 28, 1978, Ser. No. 937,457
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739415
Int. Cl.[2] B62D *27/00*
U.S. Cl. 296—190 **14 Claims**

1. A cabin for a trailer truck having a ceiling, a rear wall, seats, and a first sleeping berth behind the seats at a level about midway of the height of the rear walls, said cabin comprising a second berth separate from and independent of the first berth and having an operative position at the level of the first berth to form adjacent first and second sleeping surfaces and a sub-

stantially horizontal storage position raised above the first berth adjacent the ceiling in substantially same attitude as in



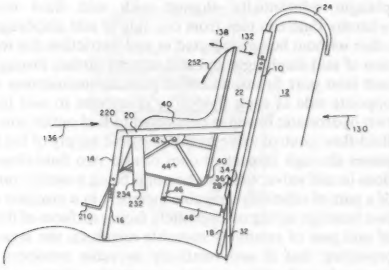
the operative position, and linkage means supporting said second berth in said cabin for movement of said second berth between said operative and storage positions.

4,215,900

CHILD'S SAFETY SEAT FOR VEHICLES

Joseph Coult, 4330 W. 5655 South, Kearns, Utah 84118

Filed Feb. 10, 1978, Ser. No. 876,625
Int. Cl.² A47C 1/08
U.S. Cl. 297—254 **21 Claims**



1. Vehicle safety seat apparatus for children comprising:

a frame having interconnected legs, intermediate structure and back structure, said frame adapted to receive a seat member, said intermediate structure being located at about the height of armrests of the seat member;

securing means associated with said frame for removably mounting said frame to external structure, said securing means adapted to receive a seat belt fastened to said vehicle;

rotation means secured to said intermediate horizontal structure, said rotation means located about midway between front and back of a seat disposed in said frame means;

a seat proportioned to accommodate a child adapted to said rotation means so that the center of gravity of said seat with a child residing therein is below said rotation means to rotate thereabout;

attachment means secured to said seat below said seat and said center of gravity; and

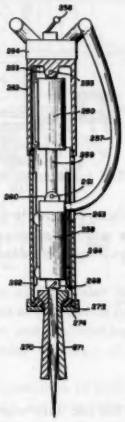
deceleration means secured to said back structure and to said attachment means to retard rotation of said seat about said rotation means.

4,215,901

HYDRAULICALLY ACTUATED TOOL FOR MECHANICALLY SPLITTING ROCK-LIKE MATERIAL

Edward R. Langfield, 140 Elmwood Rd., Glen Rock, N.J. 07452; James L. Hile, Montville, and David L. Hird, Pompton Lakes, both of N.J., assignors to Edward R. Langfield, Glen Rock, N.J.

Division of Ser. No. 795,074, May 9, 1977, Pat. No. 4,114,951.
This application Apr. 4, 1978, Ser. No. 893,346
Int. Cl.² E21C 37/02
U.S. Cl. 299—22 **8 Claims**



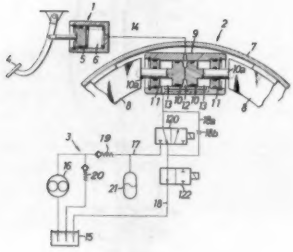
1. Apparatus for splitting rock and the like in which in an outer housing is mounted a combined hydraulic cylinder and a pneumatic vibrating cylinder, the apparatus including: (a) a retaining housing having an upper and a lower portion and having means for securing at its upper closed end including a hydraulic cylinder having a piston and a piston rod extending from and through a lower closing end of the cylinder; (b) means for removably connecting the extending rod end of the hydraulic piston to the closed end of the pneumatic cylinder; (c) a retaining housing disposed to carry the pneumatic cylinder which is movable in a lower portion of this housing as and when the pneumatic cylinder is advanced and retracted by the hydraulic cylinder; (d) cooperative guide means formed on an exterior portion of the pneumatic cylinder housing and a lower interior portion of the retaining housing to maintain an alignment of the cylinder in said outer retaining housing while sliding therein; (e) a slider wedge removably mountable and secured to a lower end of the pneumatic cylinder and movable as the pneumatic cylinder is moved by the hydraulic cylinder, the slider wedge having opposed faces formed with tapered sliding surfaces; (f) a mounting and positioning means formed and provided on the lower end of the outer housing; (g) a pair of feathers each having an enlarged upper end retaining means formed thereon, each feather having a finished inner face adapted to mate with and present a sliding surface to the wedge when passed therebetween with the increasing taper of the wedge urging the feathers apart, and (h) a lower retainer removably mounted on the lower end of said outer housing, this lower retainer securing the pair of feathers in the desired position and relationship to the slider wedge.

4,215,902

ANTI-SKID BRAKE CONTROL DEVICE AND ASSOCIATED METHOD

Makoto Sato, Kamifukuoka; Hiroshi Takamatsu, Ohimachi; Yoshitaka Miyagawa, Kawagoe, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 762,782, Jan. 25, 1977, Pat. No. 4,129,342.
This application Aug. 25, 1978, Ser. No. 936,935
Claims priority, application Japan, Jan. 29, 1976, 51/8682; Feb. 2, 1976, 51/10195; Feb. 16, 1976, 51/15607
Int. Cl.[3] B60T *8/02, 13/68*
U.S. Cl. 303—119 2 Claims



1. In a brake system for use with wheeled vehicles including a brake fluid pressure producing unit, an anti-skid brake control device comprising:

an oil-hydraulic brake mechanism associated with a vehicle wheel and including an operating member, a first hydraulic chamber defined on one side of said operating member for hydraulically driving the latter, and a second hydraulic chamber defined on the opposite side of said operating member to apply thereon an oil-hydraulic pressure counteracting the oil-hydraulic pressure applied to said operating member on said one side thereof, said first hydraulic chamber being held in fluid communication with said brake fluid pressure producing unit;

a source of fluid pressure;

a high-pressure fluid line extending between said second hydraulic chamber in said brake mechanism and said source of fluid pressure;

an oil reservoir;

a low-pressure fluid line extending between said second hydraulic chamber in said brake mechanism and said oil reservoir;

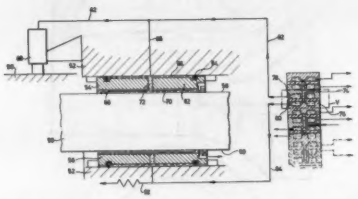
fluid control valve means inserted in said high-pressure and low-pressure fluid lines; and command system means connected with said fluid control valve means for effecting a repeated braking process in which the braking torque as applied to the wheel is rapidly reduced when the angular deceleration of the wheel exceeds a predetermined threshold value, the reducing rate of the brake torque being reduced when the angular deceleration of the wheel returns to said predetermined threshold value, is subsequently held at a definite level during the period of time that the angular acceleration of the wheel arising upon disappearance of the angular wheel deceleration is held above a predetermined threshold value, and finally begins again to rise when the angular acceleration of the wheel falls below said predetermined threshold value.

4,215,903

FLUID-FLOW CONTROL VALVES

Paul R. Andrews, Mytholmroyd, England, assignor to Staveley Machine Tools Limited, Halifax, England

Filed Jun. 13, 1978, Ser. No. 915,236
Claims priority, application United Kingdom, Jul. 6, 1977, 28208/77
Int. Cl.[2] F16C *32/06*
U.S. Cl. 308—1 R 8 Claims



1. A hydrostatic bearing arrangement including a fluid-flow control valve; said valve comprising a body defining a chamber therein; a boss projecting inwardly from each end wall of said chamber; the inner end faces of said bosses providing opposed control surfaces; a flexible diaphragm extending across said chamber and making a fluid tight seal with the walls of said chamber; said diaphragm being positioned between said two bosses so that there is a throat providing a variable fluid-flow restriction between each side of said diaphragm and a respective one of said control surfaces on said bosses, whereby movement of said diaphragm in a direction to close one of said fluid-flow restrictions opens the other fluid-flow restriction and vice versa; a single fluid inlet port opening through one of said control surfaces into the restriction between that surface and the diaphragm; a communicating port through said diaphragm substantially aligned with said fluid inlet port, whereby fluid can pass from one side of said diaphragm to the other without being subjected to any restriction due to interaction of said diaphragm and said control surface through which said inlet port opens; an outlet port communicating with the opposite side of each fluid-flow restriction to said inlet port; two hydrostatic bearings connected to said outlet ports of said fluid-flow control valve so that the fluid supply of the bearings passes through respective ones of said two fluid-flow restrictions in said valve, said two bearings being mounted on the first of a pair of relatively movable members in a machine and said two bearings acting on oppositely facing surfaces of the second of said pair of relatively movable members, the arrangement providing that if said relatively movable members tend to approach each other so as to narrow the clearance at one of said bearings and to increase it at the other of said bearings, the resultant increase in fluid pressure at the bearing where the clearance tends to narrow causes movement of said diaphragm to open the restriction appertaining to that bearing and to close the restriction appertaining to the other bearing, so that the fluid supply from said control valve to said bearings tends to restore the location of said second relatively movable member with respect to said first relatively movable member.

4,215,904

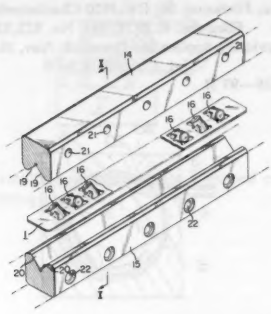
LINEAR CROSS ROLLER BEARING

Hiroshi Teramachi, 2-34-8 Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan (158)

Filed Apr. 2, 1979, Ser. No. 25,908
Claims priority, application Japan, Apr. 14, 1978, 53/048198[U]
Int. Cl.[2] F16C *29/04*
U.S. Cl. 308—6 R 4 Claims

1. A linear cross roller bearing comprising a roller cage provided with a plurality of roller pockets spaced with a longitudinal distance, each of the roller pockets including a roller

pocket opening to form two pairs of roller holding pieces of substantially the same shape, one of the roller holding piece pairs being turned in one direction and the other being turned



in the opposite direction for holding a roller between the roller holding piece pairs in an inclined position such that rollers received in every other roller pockets cross at right angles with rollers in the other roller pockets.

4,215,905

WHEEL ASSEMBLY WITH BEARINGS

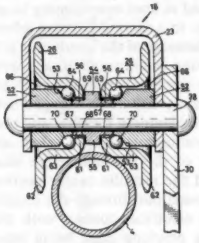
Takao Wakabayashi, Shinsenri-Minamimachi, Japan, assignor to Nakanishi Metal Works Co., Ltd., Osaka, Japan

Filed Oct. 30, 1978, Ser. No. 955,795

Claims priority, application Japan, Nov. 8, 1977, 52-150290[U]

Int. Cl.³ F16C *33/58, 13/02*

U.S. Cl. 308—182 **2 Claims**



1. A wheel assembly with bearings comprising:

(a) an axle;

(b) a pair of hat-shaped wheels independently rotatably mounted on the axle spaced at a predetermined spacing from each other, each of the wheels having an internal cup-shaped cavity, the cavity having a circumferential inner surface portion serving as an outer race and an aperture through the bottom thereof;

(c) a pair of wheel supporting members mounted on the axle in the cavities of the wheels, each of the wheel supporting members having a tapered and curved portion serving as an inner race at an inner end thereof;

(d) a plurality of balls positioned between the outer races of the wheels and the inner races of the wheel supporting members; and

(e) a spacer means for defining the spacing between the wheels and the spacing between the wheel supporting members, the spacer means being mounted on the axle between the wheel supporting members and having a large diameter portion in the middle thereof and small diameter portions at its opposite ends, the small diameter portion being placed in the aperture of the wheel with a radial clearance, and the large diameter portion facing the wheel with an axial clearance.

4,215,906

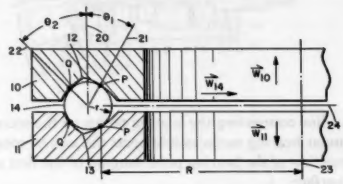
ZERO SLIP FOUR-POINT CONTACT THRUST BEARING

John M. Speicher, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jul. 19, 1979, Ser. No. 58,879

Int. Cl.³ F16C *33/58*

U.S. Cl. 308—235 **8 Claims**



1. A zero slip four-point-contact ball thrust bearing comprised of:

a first member having a circular raceway disposed thereon;

a second member having a circular raceway spaced apart from and aligned with said raceway of said first member; and

a plurality of balls in said circular raceways, each of said balls making contact at two points on the circular raceway of said first member and also making contact at two other points on the circular raceway of said second member; wherein

the cross-sectional dimensions of both of said circular raceways and said balls are interrelated as defined by the equation;

$$0 = \cos\theta_1 (1 + \frac{r}{R} \sin\theta_1 + \frac{r}{R} \sin\theta_2) - \cos\theta_2$$

where R is the distance from the center of said circular raceways to the contact point nearest that center;

r is the radius of said balls;

θ_1 is the angle between a first hypothetical line perpendicular to said circular raceways, and second hypothetical line through the center of said balls and through the contact point nearest the center of said circular raceways, and

θ_2 is the angle between said first hypothetical line and a third hypothetical line through the center of said balls and through the contact point furthest from the center of said circular raceways.

4,215,907

BALL-BEARING ARRANGEMENTS

Louis Pohl, Julius-Vosseler-Strasse 55h, 2000 Hamburg 54, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,749

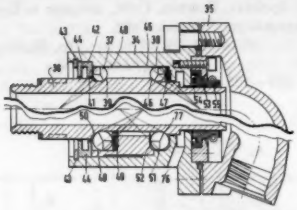
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728186

Int. Cl.² F16C *33/58, 27/00*

U.S. Cl. 308—189 A **5 Claims**

1. In a three-point annular ball bearing arrangement comprising a first bearing ring having a first inclined annular ball bearing surface with a tangent at its bearing point oblique to and intersecting the axis of rotation of the ball bearing arrangement, a second bearing ring having a second annular ball bearing surface, and a third bearing ring having a third radial annular ball bearing surface and connected for common rotation with the second bearing ring, the third bearing ring being axially moveable and the third radial annular bearing surface having radial tangent at its bearing point and being axially

biased toward the first inclined annular bearing surface, the improvement wherein the third bearing ring is a spring washer which itself, axially biases the third radial annular bearing surface toward the first inclined annular bearing surface and



wherein a line connecting the bearing points on the second and third annular bearing surfaces intersects the axis of rotation at the intersection of the bearing point tangent of the first annular bearing surface.

4,215,908

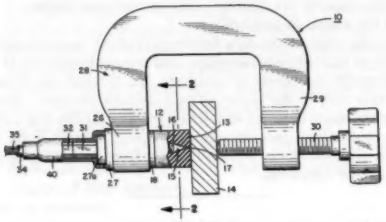
ARCLESS CLAMP CONNECTOR

Raymond B Cherry, Dickinson, and Leroy A. Bash, Sugarland, both of Tex., assignors to Cathodic Protection Services, Inc., Houston, Tex.

Filed Dec. 15, 1978, Ser. No. 969,763

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—96 **6 Claims**



1. An arcless clamp connector comprising:

a block made of an elastic, compressible, insulating material and having a contact surface,

at least one electric contact member embedded in said block adjacent to and facing said contact surface,

a clamp having a body carrying said block, said body being C-shaped and having a pair of opposed legs, said block being mounted on one leg facing the other leg, and

clamping means mounted on said other leg for clamping said block to an electric conductor member, whereby the clamping pressure of said clamping means compresses said material until said contact member pierces said contact surface and establishes a forced electric connection between said conductor member and said electric contact member, and said compressed material sealing off said electric connection from the ambient medium.

4,215,909

ELECTRICAL TERMINAL CLAMP FOR ESTABLISHING AN ELECTRICALLY CONDUCTING CLAMPING CONNECTION

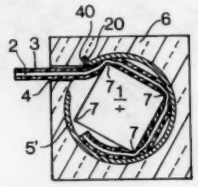
Axel Olsen, Fortunvej 86, DK-2920 Charlottenlund, Denmark

Filed Jul. 6, 1978, Ser. No. 922,322

Claims priority, application Denmark, Nov. 18, 1977, 5136/77

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—97 R **21 Claims**



1. An electrical terminal clamp which comprises

a housing having a cylindrical cavity with an electrically conductive wall and including at least one opening for allowing at least one insulating conductor to be inserted therethrough and into said cavity,

a clamping member mounted for rotation within said cavity about a fixed axis, said clamping member having at least one non-cutting pinching edge oriented so as to be generally transverse to a center line through each of said openings in said housing, the surface portions of the clamping member adjacent each rounded edge forming an angle of not more than 135° with each other, said clamping member being mounted so as to be movable from a first position at which an insulated conductor can be introduced through said at least one opening in said housing and into said cavity, to a second position wherein a slot narrower than the diameter of the conductor is formed between the pinching edge and the wall of said cavity and the insulated conductor extending through said at least one opening into said cavity will be so clamped between said pinching edge of said clamping member and the wall of said cavity that the conductor will be taken along in the further movement of the pinching edge along the wall of the cavity, and the metallic center portion of the conductor will be pressed out through the conductor insulation and become in electrical contact with the cavity wall, said non-cutting pinching edge being rounded and having a radius of curvature less than 1 mm, the total turning angle of said contact member between the first position and said second position being at least 60°.

4,215,910

ELECTRICAL CONNECTOR

Donald P. G. Walter, Harrow, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 15, 1978, Ser. No. 970,084

Claims priority, application United Kingdom, Dec. 22, 1977, 53563/77

Int. Cl.[2] H01R *3/06*

U.S. Cl. 339—143 R **2 Claims**

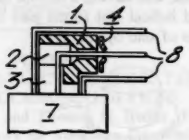
1. An electrical connector comprising:

a. a housing of electrically insulating material;

b. a plurality of electrical contacts each having a post portion formed in an L-shape, said post portions being arranged in three parallel, substantially coterminous rows in the housing; and

c. an electrically conductive shielding member, substantially L-shaped in cross-section, mounted on the center row of post portions and extending the length of the outer rows of post portions and around the bends thereof, said shielding member further having a plurality of spaced parallel

walls each extending between a pair of adjacent post portions of the center row with the two outer rows of post



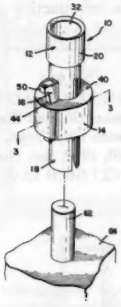
portions extending about the outer L-shaped extremities of the shielding member.

4,215,911

BATTERY TERMINAL FOR TELEPHONE STORAGE BATTERIES

Larry E. Dittmann, Harrisburg, and Van K. Webster, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 25, 1979, Ser. No. 43,393
Int. Cl.[2] H01R 7/06
U.S. Cl. 339—240 3 Claims



1. A battery terminal for use with cylindrical battery posts, which comprises:

a. a socket having wire receiving means at one end and a hollow cylindrical section at the other end for sliding onto a cylindrical battery post, said cylindrical section being longitudinally slotted to provide two or more resilient fingers;

b. a member having an opening therethrough with a longitudinal slot cut into the wall along one side thereof, the floor of the slot being beveled from one side of the member to the other, said member slidably positioned on the cylindrical section; and

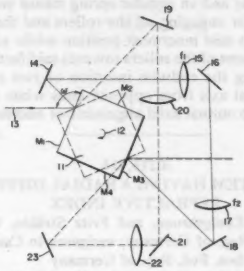
c. an elongated wedge having one straight side and an opposing beveled side slidably positioned in the slot in the member with the beveled side against the slot's beveled floor so that the wedge's straight side faces the opening and is parallel thereto, said member and wedge cooperating to compress the cylinder's fingers about a cylindrical battery post to provide electrical contact and mechanical retention therewith.

4,215,912

HIGH SPEED SCANNING DEVICE FOR SCANNING THE SAME AREA PLURAL TIMES BY A BEAM DEFLECTED BY A SINGLE DEFLECTING SURFACE

Kazuo Minoura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1978, Ser. No. 902,957
Claims priority, application Japan, May 17, 1977, 52-56940
Int. Cl.[2] G02B 27/17
U.S. Cl. 350—6.8 7 Claims



1. A scanning optical system comprising:

a light source;

a deflector provided with at least two deflecting surfaces and adapted to deflect the light beam from said light source to a predetermined direction; and

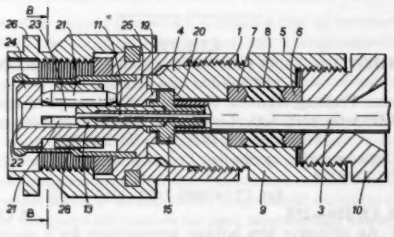
a transmission optical system, which permits scanning of the same scan area plural times by a beam deflected by a single deflecting surface of said deflector, including means for spatially dividing the deflected light flux deflected by a first deflecting surface of said deflector into plural partial light fluxes and means for guiding the thus divided partial light fluxes through said transmission optical system to a second deflecting surface of said deflector to perform scanning of said scan area.

4,215,913

OPTICAL FIBRE CONNECTORS

Wilfred H. Turley, and John A. Robinson, both of Kingsthorpe, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed May 1, 1978, Ser. No. 901,802
Claims priority, application United Kingdom, May 2, 1977, 18241/77
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 8 Claims



1. An optical-fibre connector for effecting optical end-to-end coupling between two optical fibres, each fibre of which is fitted, at the end to be coupled, with a ferrule having a precision-cylindrical outside surface of a diameter within a given range, the end of each said fibre being received in said ferrule

coaxially with said cylindrical surface, said connector comprising: a set of cylindrical rollers of equal diameter, each terminated at both ends by a tapered end portion; a cage structure holding said rollers parallel to each other and uniformly spaced from each other in an annular array about a central axis parallel to the cylinder axis of the rollers while allowing the rollers to move radially of said central axis between an innermost position at which the diameter of the interior common tangent cylinder of all the rollers is smaller than the minimum diameter of said given range, and a further position at which the diameter of said tangent cylinder is greater than the maximum diameter of said range; and an annular spring means encircling said case structure for engaging all the rollers and thereby urging said rollers onto said innermost position while yielding resiliently to movement of the rollers towards said further position, thereby allowing the endwise insertion of two such ferrules along the central axis from opposite ends while causing said rollers to ensure mutual axial alignment of said ferrules.

4,215,914

OPTICAL SYSTEM HAVING A RADIAL DIFFERENCE IN REFRACTIVE INDEX

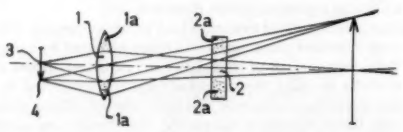
Franz Muchel, Königsbronn, and Fritz Strähle, Oberkochen, both of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Dec. 12, 1978, Ser. No. 968,630

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2756989

Int. Cl.[2] G02B 3/00

U.S. Cl. 350—175 GN **7 Claims**



1. An optical system having at least one element of so-called gradient glass having a radial difference in refractive index, characterized by the fact that the radial difference in refractive index of said element is substantially in accordance with the formula

$$n = n_o e^{Kh}$$

wherein the independent variable h represents the radial distance of a point of the optical element from the central axis of such element, the dependent variable n represents the index of refraction of the element at that point, K represents a constant material-dependent factor of the gradient glass element, and n_o is the index of refraction of the gradient glass element on its central axis, and e represents the irrational number 2,7182818.

4,215,915

OBJECTIVE LENS HOLDING ARRANGEMENT FOR A MICRO-FILM READER

Gunter Freiberg, Munich, Fed. Rep. of Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,263

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750458

Int. Cl.[2] G02B 7/04, 7/18

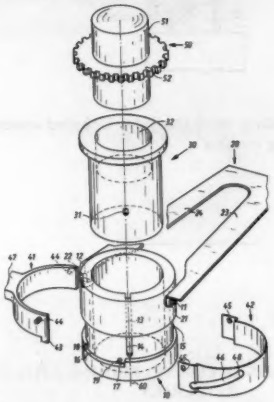
U.S. Cl. 350—255 **6 Claims**

1. An objective lens holding arrangement for a microfilm reader, comprising in combination,

an objective lens tube for mounting an objective lens therein, said objective lens tube having a pin projecting therefrom;

a holding tube adapted to adjustably non-rotatably coaxially support said objective lens tube, said holding tube being operatively mounted in said microfilm reader and having a first straight slot extending parallelly to the optical axis of said objective lens;

an adjusting ring coaxially and rotatably mounted on said holding tube, and having a second helical slot, the helix of which said helical slot forms part of is coaxial with the optical axis of said optical lens;



said pin extending into said first and second slots, so that the movement of said objective lens tube relative to said holding tube and adjusting ring is guided by said first and second slots respectively;

said helical slot in said adjusting ring includes a portion of enlarged diameter relative to the remainder of the helical slot to facilitate the introduction of said pin into said helical slot.

4,215,916

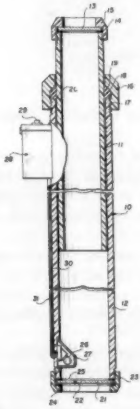
SUBMERGED METER READING DEVICE

Billy W. Bell, 708 E. Summer St., and Walter D. Ferguson, 405 N. First St., both of Union City, Tenn. 38261

Filed May 30, 1979, Ser. No. 43,652

Int. Cl.[2] G02B 23/22

U.S. Cl. 350—319 **5 Claims**



1. A submerged meter reading device comprising a scope having telescoping tube sections and lenses at the opposite ends of the scope, one lens having an aperture by means of which

fluid may be drawn into the scope by suction when the scope is extended and by means of which a pressurized fluid stream can be expelled from the scope to wash a meter face when the scope is compressed, and an illuminating means in the scope near the lens having said aperture.

4,215,917

ION EXCHANGE-ELECTROLYTE LAYER FOR ELECTROCHROMIC DEVICES

Robert D. Giglia, Rye, and Thomas B. Reddy, Pound Ridge, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 27, 1976, Ser. No. 735,940
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—357 **12 Claims**

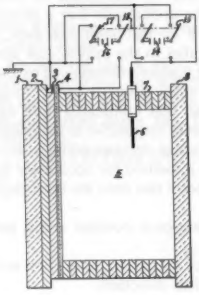
1. In an electrochromic variable light modulating device having an arrangement comprising a light transmitting substrate with a persistent electrochromic material as a light modulating material and a counter-electrode separated from said substrate by an ion conducting medium, an improved ion conducting medium comprising a polymeric ion exchange membrane layer wetted with an electrolyte solution.

4,215,918

ELECTROCHROMIC DISPLAY DEVICE

Derek B. Dove, Mt. Kisco, N.Y., assignor to Board of Regents, State of Florida, Tallahassee, Florida, for the use and benefit of the University of Florida, Gainesville, Fla.

Filed Sep. 13, 1978, Ser. No. 942,073
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—357 **5 Claims**



1. In a variable light transmission device comprising a layer of a persistent electrochromic material, said material having its optical absorption alterable by addition or removal of electrons, a layer of electrolyte, said electrolyte and said electrochromic material being between a pair of electrodes, and means for connecting said electrodes to electric source means, the combination of a transparent conductive film interposed between and in contact with said electrolyte and said electrochromic material layers and spaced from said electrodes, and means for connecting said transparent conductive film to said electric source means.

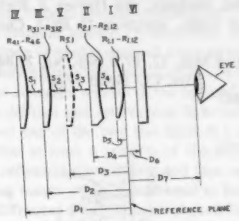
4,215,919

REFRACTOR OPTICAL SYSTEM

Edward B. Rybicki, Depew, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed Apr. 7, 1978, Ser. No. 894,455
Int. Cl.[3] A61B *3/04*
U.S. Cl. 351—29 **10 Claims**

1. A lens series for a refractor having a plurality of lenses positionable at each of more than two positions spaced along an optical axis and a reference plane at one of the positions which comprises, the plurality of lenses being positionable at the reference plane including a zero power lens consisting of the same glass, having the same thickness, having the same



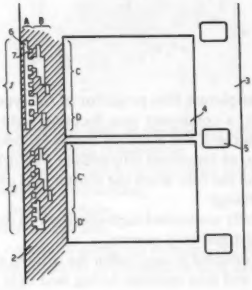
radius on one surface and the same distance to other lenses on the optical axis.

4,215,920

MEANS FOR POST-PRODUCTION FILM-MAKING

Matthew T. Butler, 3/45 Streatfield Rd., Bellevue Hill, New South Wales, Australia

Filed Jan. 24, 1979, Ser. No. 6,033
Claims priority, application Australia, Jan. 25, 1978, PD 3139
Int. Cl.[2] G03B *21/50*
U.S. Cl. 352—92 **7 Claims**

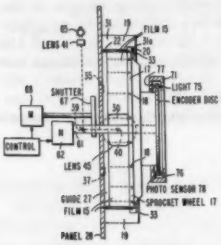


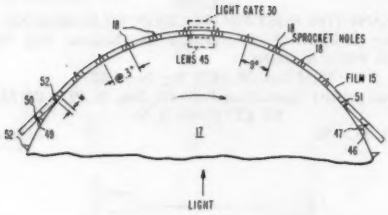
1. A motion picture film which includes a row of sprocket holes along one marginal edge portion and a longitudinally extending area carrying a photo-sensitive layer for photographing a selected scene, or series of scenes in a succession of stationary frames, said film being characterised in that one of its marginal edge portions carries a latent-image numerical identification of each of said successive frames in binary code form adjacent each said frame, said binary code extending along said marginal edge such that information corresponding to individual digits is spaced in the longitudinal direction of said film, the coded information for each separate digit extending transversely across said film, said binary code including a start pulse initiator, and a plurality of equally spaced sync pulses each corresponding to and locating a separate digit identified by further coding, and wherein all coding information corresponding to any one frame is simultaneously imprinted onto said film.

4,215,921
INTERMITTENT PRIME FILM MOVER USING MULTI-TOOTHED WHEEL DRIVE

Adron M. Miller, Burbank, and Harvey J. Richardson, Sepulveda, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 22,841
Int. Cl.[2] G03B *1/24*
U.S. Cl. 352—187 4 Claims





1. In a motion picture film projector of the type including a projection light, a condenser lens focusing light onto a film frame, a gate aperture, and a shutter means for interrupting the light to the film, an improved intermittent film drive for intermittently driving the film when the shutter cuts off the light to the film, comprising:

an electronically controlled high-speed servo motor capable of rapid start and stop motion,

pulser means coupled to said motor for driving said motor in rapid start and stop motions during said light cut-off time periods,

a sprocket wheel coupled to said motor, said sprocket wheel having a plurality of sprocket teeth extending radially therefrom to engage more than four sprocket holes in the film, said sprocket teeth being configured and spaced such that each sprocket hole contacts the trailing edge of the sprocket tooth when being engaged and contacts the leading edge of the sprocket tooth when being disengaged to thereby capture the film securely on said sprocket wheel between the leading edge of one sprocket tooth and trailing edge of another sprocket tooth,

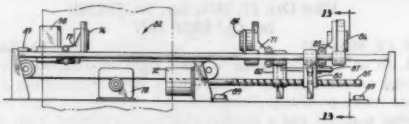
said sprocket wheel being positioned relative to said light gate aperture and condenser lens such that the film captured on said wheel passes between said lens and light gate aperture, and

said wheel being of a sufficiently large diameter so that a single frame of film resides in substantially a vertical plane at said gate aperture, with the film drive force distributed over the length of tape captured on the wheel.

4,215,922
METHOD FOR PROJECTING CHARACTERS AT A SELECTED POINT SIZE IN A PHOTOCOMPOSITION MACHINE

Francis S. Szabo, Morristown, and George G. Pick, Mendham, both of N.J., assignors to AM International, Inc., Los Angeles, Calif.

Division of Ser. No. 830,129, Sep. 2, 1977, Pat. No. 4,135,794, which is a continuation of Ser. No. 576,382, May 12, 1975, abandoned. This application Nov. 1, 1978, Ser. No. 956,682
Int. Cl.[3] B41B *15/00*; G03B *3/00*
U.S. Cl. 354—5 5 Claims



1. In a photocomposition machine comprising: font means for providing at least one font of a plurality of characters; projection light source means for successively illuminating preselected characters of said font means so that the characters are projected along an optical axis and onto a print plane; a photosensistive receiving sheet located in the print plane; input means for generating point size data representative of the point size of a character selected by an operator for photocomposition from a plurality of available point sizes; variator lens means for successively forming a plurality of aerial images representing a plurality of degrees of magnification of said preselected characters by movement of said variator lens means parallel to the optical axis into a plurality of different positions determined by the point size data; collimator lens means movable parallel to the optical axis into a plurality of different composing positions determined by the point size data in which the aerial image forms an object image for the collimator lens means so that collimated light rays are formed; decollimator lens means responsive to the collimated light rays for focusing a print image corresponding to the aerial image on the receiving sheet, a method for accurately focusing characters at the selected point size onto the receiving sheet comprising the steps of:

defining a first reference position and a second reference position;

driving the variator lens means to the first reference position in a predetermined direction;

driving the collimator lens means to the second reference position in a predetermined direction;

driving the variator lens means from the first reference position to a first one of said composing positions determined by said point size data only in a direction opposite the predetermined direction in which the variator lens means is driven to the first reference position; and

driving the collimator lens means from the second reference position to a second one of said composing positions determined by said point size data only in a direction opposite the predetermined direction in which the collimator lens means is driven to the second reference position.

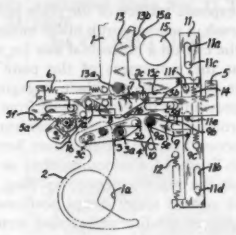
4,215,923
PROGRAMMED SHUTTER

Kiyoshi Kitai, and Hiroaki Ishida, both of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,743
Claims priority, application Japan, Nov. 18, 1977, 52-138738
Int. Cl.[2] G03B *7/14*
U.S. Cl. 354—30 7 Claims

1. A programmed shutter mechanism for a camera, comprising: a control member having a position controlled in response to a brightness of an object to be photographed; a driving member releasable to travel from a cocked position to a rest

position; means for releasing said driving member; at least one sector-aperture blade; a sector operating member mounted for pivoting about a fixed axis, said sector operating member having a portion for engaging said sector-aperture blade to operate said sector-aperture blade for controlling exposure; means biasing said sector operating member to pivot about said fixed



axis in a direction to close said sector-aperture blade; and sector opening means mounted on said driving member and cooperative with said control member for pivoting said sector operating member in a direction effective to open said sector-aperture blade through a distance determined by said control member as said driving member travels from the cocked position to the rest position.

4,215,924

METHOD TO CONTROL INTRODUCTION OF DIFFRACTED BEAM BY MEANS OF DIFFRACTION ELEMENT

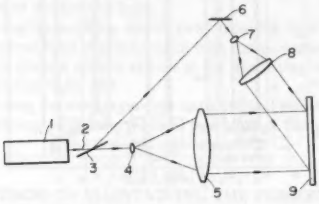
Kazuya Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 812,778, Jul. 5, 1977, Pat. No. 4,172,646, which is a continuation of Ser. No. 422,337, Dec. 6, 1973, abandoned. This application Sep. 29, 1978, Ser. No. 947,066

Claims priority, application Japan, Dec. 11, 1972, 47-124196; Nov. 29, 1973, 48-134782

Int. Cl.[2] G03B *1/00*

U.S. Cl. 354—59 **19 Claims**



1. A method for measuring varying intensities of light comprising:

exposing an image forming optical system to the varying intensities of light and directing the light along an optical path within the system;

receiving the varying light by one of two flat faces of a planar optical system having an end face;

intercepting at least a section of the varying light in the path with a diffraction element whose size within the path of the light remains constant;

diffracting the light incident on the diffraction element out of the optical path so that at least a portion of the diffracted light reaches one of the flat faces of the planar optical system at a total reflection angle;

internally reflecting the diffracted light by the flat faces toward said end face; and

receiving the diffracted light projected from the end face by light detecting means;

said intercepting step including orienting the element substantially perpendicular to the optical path.

13. An apparatus for measuring portions of light incident on an image forming optical system, comprising:

a diffraction element having a transparent sheet and a diffraction lattice of predetermined size carried by the sheet, said sheet having two flat faces, said lattice being arranged to intercept at least a section of the light of predetermined size and to diffract said intercepted light out of the optical path toward one of the two flat faces at a total reflection angle so that at least a portion of the diffracted light is internally reflected toward said end face, and

light detecting means in the direction of at least a portion of the light diffracted from the optical path for measuring at least a portion of the light diffracted from the optical path.

4,215,925

PHOTOGRAPHIC CURTAIN-TYPE SHUTTER WITH ELECTROMAGNETIC ACTUATION CONTROL

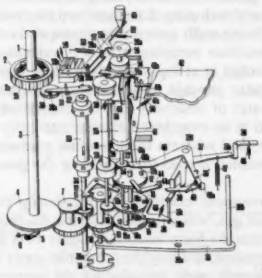
Nobuaki Date; Hiroshi Aizawa, and Teiji Hashimoto, all of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 890,944

Claims priority, application Japan, Apr. 25, 1977, 52/47571

Int. Cl.[2] G03B *9/34*

U.S. Cl. 354—234 **4 Claims**



1. A camera provided with an electrically controllable focal plane shutter, said camera comprising:

(a) a shutter control circuit including an electromagnet;

(b) a film winding mechanism;

(c) a front shutter curtain;

(d) a rear shutter curtain;

(e) a front curtain winding-up member engaging said front curtain and rotatable in connection with said film winding mechanism;

(f) a rear curtain winding-up member engaging said rear curtain coaxially rotatable with but independently from said front curtain winding-up member, said rear curtain winding-up member being moved by said front curtain winding-up member to wind-up said rear shutter curtain;

(g) front curtain latching means for latching said front curtain in a running down ready position after the completion of shutter winding-up and for releasing said front curtain in response to release means; and

(h) rear curtain latching means for latching said rear curtain in a running down ready position after the completion of shutter winding-up and responsive to the action of said electromagnet resulting from the production of an output from said shutter control circuit for releasing said rear curtain;

said front curtain winding-up member and said rear curtain winding-up member being taken out of engagement with each other when said front and rear curtains are latched, respectively, by said front and rear curtain latching means.

4,215,926
PROCESS FOR CONDUCTING AMMONIA IN A DEVELOPING APPARATUS USED FOR DEVELOPING DIAZOTYPE COPYING MATERIAL

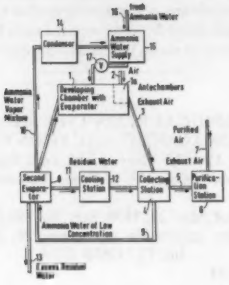
Eckehard Stein, Frankfurt am Main, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,439

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1976, 2659485

Int. Cl.[2] G03D 7/00

U.S. Cl. 354—300 **6 Claims**



1. In the process for conducting ammonia in a developing apparatus for developing diazotype copying material, wherein exhaust air laden with gaseous ammonia and composed of the developer medium escaping from a developing chamber and air, is conducted in at least one absorption vessel countercurrently to water capable of absorbing ammonia; wherein the ammonia water of relatively low concentration thus obtained is conducted in an evaporator countercurrently to a stream of water vapor; and wherein the ammonia gas/water vapor mixture thus obtained is used for preparing the gaseous developer medium;

the improvement comprising completely condensing the ammonia gas/water vapor mixture discharged from said evaporator to form ammonia water of a relatively high concentration; holding the ammonia water in an ammonia water supply tank; introducing the ammonia water discharged from the ammonia water supply tank, at a constant rate, into an evaporator which is in direct connection with the developing chamber; and passing the ammonia gas/water vapor mixture produced by evaporation from the evaporator into the developing chamber.

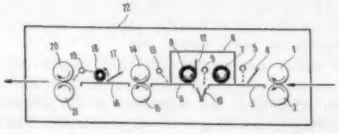
4,215,927
LITHOGRAPHIC PLATE PROCESSING APPARATUS

Clyde P. Grant, Gorham, and Richard M. Lowe, South Portland, both of Me., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 13, 1979, Ser. No. 29,664

Int. Cl.[2] G03D 5/04

U.S. Cl. 354—317 **1 Claim**



1. In a lithographic plate processing apparatus which comprises means for moving an exposed lithographic plate through the apparatus on an uphill slope, developer means within the apparatus for applying a developer liquid to the plate as it moves through the apparatus, and gumming means within the apparatus for applying gum to the plate after it has been developed, the developer means including a development enclosure through which the plate passes, a first scrub brush mounted inside the enclosure near the entrance on a horizontal axis for rotation in the direction of plate movement in scrubbing contact with the plate, first spray means for spraying developer liquid onto the exposed surface of the plate before it reaches the first scrub brush, a second scrub brush mounted inside the enclosure near the exit on a horizontal axis for rotation in the direction against the movement of the plate in scrubbing contact with the plate, a doctor blade engaging the second scrub brush for preventing developer liquid from being thrown forward by the rotation of the second scrub brush, and drainage means positioned beneath the enclosure between the first and second scrub brushes for removing dirty developer flowing from the plate, the improvement comprising, as part of the developer means, second spray means positioned within the enclosure and between the first and second scrub brushes for flowing clean developer liquid onto the exposed surface of the plate to simultaneously wash the dirty developer liquid from the plate and provide fresh developer on the plate as it is scrubbed by the second scrub brush.

4,215,928
APPARATUS FOR TREATING THE SURFACES OF CYLINDRICAL OBJECTS IN A NUMBER OF SEQUENTIAL STEPS

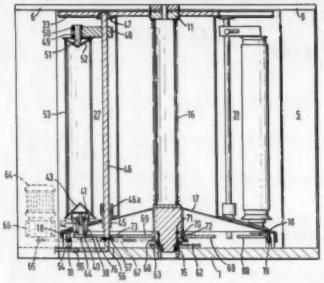
Barry J. Bayley, Newton-le-Willows, England; Austin Brittain, Dumfries, Scotland; Kenneth Graham, St. Lukes, Near Warrington, England, and Clive S. Thawley, Dumfries, Scotland, assignors to Uniroyal Limited, Newbridge, Scotland

Filed Mar. 30, 1979, Ser. No. 25,633

Claims priority, application United Kingdom, Apr. 11, 1978, 14222/78

Int. Cl.[2] G03D 5/04

U.S. Cl. 354—319 **9 Claims**

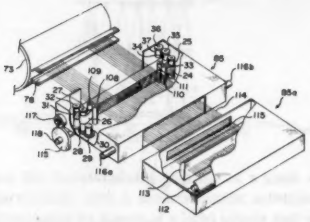


1. Apparatus for treating the surfaces of cylindrical objects in a number of sequential steps, comprising a carrier rotatable about a central axis, the carrier having a central section and a plurality of walls extending radially from the central section to define a radial series of compartments, means for rotating the carrier about said central axis, mounting means in each compartment for releasably engaging opposite ends of a cylindrical object to support said object in said compartment with the axis of said object parallel to said central axis, means for rotating said mounting means to rotate said object about its axis, a series of treatment bays arranged around the circumference of the carrier, means separating each treatment bay from any adjacent bay, cooperating sealing means on each separating means and each wall for creating a seal when the wall and separating means are radially aligned, and means for indexing said carrier through a plurality of angular positions wherein each compartment sequentially confronts a respective treatment bay and is sealed from adjacent treatment bays by said sealing means.

4,215,929
IMAGE FORMING METHOD AND APPARATUS CAPABLE OF CONTROLLING AN ELECTROSTATIC IMAGE FORMATION AREA

Tadashi Sato, Kokubunji, and Atsushi Kubota, Komae, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1978, Ser. No. 942,119
Claims priority, application Japan, Sep. 17, 1977, 52/111873; Feb. 28, 1978, 53/23048
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—7 **25 Claims**



1. An image forming method, wherein an electrostatic latent image is formed on a photosensitive body by electric charging and image exposing steps, and the latent image is developed to obtain the image, which comprises the steps of:

(a) maintaining masking means away from the light path of a control light until a first portion of the photosensitive body which corresponds to the front end of a necessary or an unnecessary region of an electrostatic latent image reaches the irradiating region of said control light;

(b) moving the masking means to intercept the light path of the control light in synchronism with the movement of said first portion after it reaches the irradiating region of the control light;

(c) causing said masking means to be kept in its state of perfectly blocking the light path of the control light until a second portion of the photosensitive body which corresponds to the rear end of the necessary or unnecessary electrostatic latent image region arrives at the irradiating region of the control light;

(d) moving the masking means away from the light path of the control light in synchronism with the movement of the second portion after it arrives at the irradiating region of the control light; and

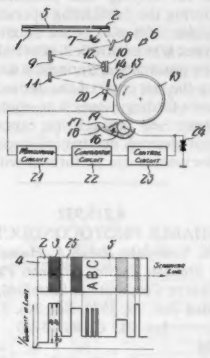
(e) returning the masking means to its original position upon completion of the electrostatic latent image formation.

4,215,930
METHOD OF MAINTAINING THE CORRECT CONDITIONS OF AN ELECTROPHOTOGRAPHICALLY DUPLICATED IMAGE

Seiichi Miyakawa; Susumu Tatsumi, and Koji Sakamoto, all of Tokyo, Japan, assignors to Ricoh Company, Limited, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,175
Claims priority, application Japan, Feb. 23, 1977, 52-18058; Feb. 25, 1977, 52-19908
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 D **8 Claims**

1. A method for maintaining correct the developing bias voltage, charge, exposure and other conditions of a duplicated image in an electrophotographic process having charging and exposing steps for forming an electrostatic latent image on a photosensitive medium, which comprises setting a reference plate on a copy supporter together with an original copy so as to permit a duplicating process to proceed, said reference plate being provided with two areas dark-tone and light-tone having a predetermined density difference therebetween, detecting the difference between the quantities of light reflected from the dark-tone and light-tone areas of said reference plate to control

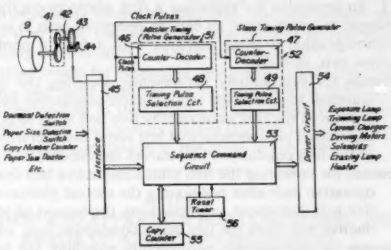


each condition of the duplicating process so that a correct duplicated image may be obtained.

4,215,931
ELECTROPHOTOGRAPHIC APPARATUS

Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita; Masaji Nishikawa, both of Hachioji; Akira Shimizu, Fuchu, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,623
Claims priority, application Japan, Apr. 18, 1978, 53/46185; Jan. 26, 1979, 54/7802
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 R **15 Claims**



1. An electrophotographic apparatus for forming any desired number of duplicated copies of a document from the same and single electrostatic charge latent image corresponding to the document to be duplicated once formed on a photosensitive member, by repeating a step for developing the latent image with toner particles to form a visible toner image and a step for transferring the toner image onto a record paper to form a final copy, comprising

means for generating clock pulses having a given period;

first and second timing pulse generators for receiving the clock pulses to produce various timing pulses in synchronism with the duplicating operation;

means for receiving the timing pulses to produce various control signals for controlling the duplicating operation;

means for feeding the document to be duplicated through an exposure-scanning portion at a constant speed;

means for detecting the document at said document feeding means to produce a document detection signal;

means for setting the desired number of copies to be formed from the single document to produce a copy number signal; and

means for receiving given timing pulses from one of the first and second timing pulse generators, the document detection signal and the copy number signal to produce a control signal for driving said document feeding means; whereby during the duplicating operation for forming the desired number of copies of the document the document feeding means is so controlled as to hold a next document at a stand-by position and during the duplicating operation for forming the last copy of the desired number of copies the document feeding means is so controlled as to initiate the document feed through the exposure-scanning portion, so that desired number of copies of successively supplied documents can be formed without interruption.

4,215,932

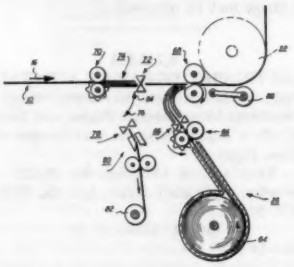
REPLENISHABLE PHOTOCONDUCTIVE SYSTEM

Vittorio Castelli, Scarsdale; Ralph A. Hamaker, Penfield, both of N.Y., and Stephen T. Chai, Rancho Palos Verdes, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 29, 1979, Ser. No. 53,645

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—16 **15 Claims**



1. An apparatus for replacing a first photoconductive belt arranged to move about an endless operative path in an electrophotographic printing machine with a second photoconductive belt, including:

means for substantially permanently securing the leading marginal region of the second photoconductive belt to a portion of the first photoconductive belt so as to position the second photoconductive belt about the operative path as the first conductive belt moves thereabout;

means for removing the first photoconductive belt from the operative path after positioning the second photoconductive belt thereabout and separating the second photoconductive belt from the first photoconductive belt; and

means for substantially permanently attaching the leading marginal region of the second photoconductive belt to the trailing marginal region thereof.

4,215,933

PROJECTION SYSTEM FOR COPYING MACHINES

Paul Feneberg, Buchendorf; Georg Königl, Munich; Günther Kirchhof, Taufkirchen, and Anton Schätz, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

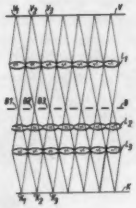
Filed Dec. 19, 1978, Ser. No. 971,079

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757386

Int. Cl.² G03B *27/50*

U.S. Cl. 355—50 **17 Claims**

16. In a copying machine of the type which comprises a projection system and in which relative movement is effected between the projection system and a photosensitive surface in a predetermined relative-movement direction to successively project successive strip-shaped zones of an original onto successive strip-shaped zones of the photosensitive surface, the projection system being of the type comprising a plurality of lens bars including two projection lens bars and an intermediate field lens bar, each lens bar comprising at least one row of lenticular elements extending transverse to the relative-movement direction, the projection system comprising at least one row of component projection objectives, each such row of component projection objectives likewise extending transverse to the relative-movement direction, the individual projection objectives being constituted by respective corresponding ones of the lenticular elements of the plurality of lens bars, the lens



bars forming component images on the photosensitive surface and also forming an intermediate image plane; the projection system additionally including a lens-aperture structure provided with at least one row of lens apertures located in the intermediate image plane, the adjoining boundaries of adjoining ones of the lens apertures extending at an angle relative to the direction perpendicular to said relative-movement direction, said angle being at most equal to 80°, the lenticular elements on the field lens bars individually having shapes the same as the shapes of the lens apertures.

4,215,934

PRINTING APPARATUS

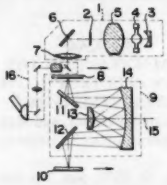
Tamotsu Karasawa, Kawasaki; Ichiro Kano, and Hideki Yoshinari, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1978, Ser. No. 949,048

Claims priority, application Japan, Oct. 6, 1977, 52-120420

Int. Cl.² G03B *27/48, 27/50, 27/70*

U.S. Cl. 355—51 **5 Claims**



5. A printing apparatus for use in the manufacture of semiconductor circuit elements, comprising:

an illuminating system for illuminating a mask;

a mask holder for supporting said mask in an upper plane;

a wafer holder for supporting a wafer in a lower plane;

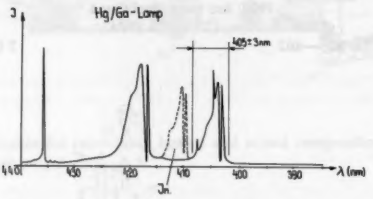
optical mirror imaging means comprising a concave mirror and a convex mirror the centers of curvature of which lie substantially on an optical axis positioned between said upper and lower planes and are parallel thereto; and

displacing means for displacing one of said means linearly in the direction of said optical axis relatively to the other of said means.

4,215,935
METHOD AND DEVICE FOR THE PROJECTION PRINTING OF A MASK ONTO A SEMICONDUCTOR SUBSTRATE

Ernst W. Loebach, Tonagass 374, FL-949 L Eschen, Liechtenstein

Filed May 24, 1979, Ser. No. 42,031
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—67 **4 Claims**

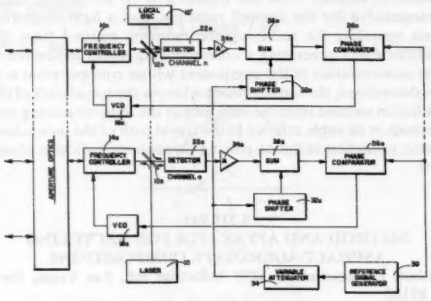


1. A method for the projection printing of a mask onto a workpiece, particularly onto a semiconductor substrate, said mask being illuminated by means of a light source and imaged on said workpiece by means of a projection lens, said workpiece being coated with a photoresist, wherein a gallium-doped mercury vapor lamp is used as said light source.

4,215,936
SHARED POINTING FOR OFFSET TARGET OF AN ADAPTIVE PHASED ARRAY

Joseph Winocur, Newport Beach, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 5, 1974, Ser. No. 486,032
Int. Cl.[3] G01C *3/08*; H04B *9/00*; G01B *11/26*
U.S. Cl. 356—5 **18 Claims**



1. In a coherent optical adaptive target tracking system wherein the phase of a wave received from a reflecting target is measured at a receiver and an adapted wave is transmitted having a phase that is adjusted in accordance with said measured phase to focus a first energy lobe on said target and to compensate for perturbations in the energy transmission path including distortion caused by the propagating medium between said target and the system, the improvement comprising

means for generating a fictitious target signal component that simulates a wave reflected from a fictitious target that is offset by a predetermined amount from said reflecting target,

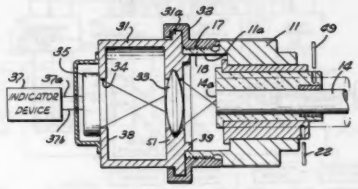
means for combining said fictitious target signal component with a real target signal component representing the received wave reflected from said reflecting target, and

means for adjusting the phase of the transmitted wave in accordance with the phase of the combined fictitious and real target signal components, whereby a second lobe of the transmitted wave is focused at the location of said fictitious target.

4,215,937
METHOD AND APPARATUS FOR DETECTING OPTIMUM ALIGNMENT OF OPTICAL FIBERS IN A CONNECTOR ARRANGEMENT

Leslie M. Borsuk, Los Alamitos, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,645
Int. Cl.[3] G01N *21/00*; G01B *11/00*
U.S. Cl. 356—73.1 **10 Claims**



1. Apparatus for detecting optimum lateral alignment of an end of an optical fiber, said fiber having a core with a first index of refraction and cladding with a second index of refraction, comprising:

first means for admitting light rays into said optical fiber from the external perimeter thereof at a physical angle producing appreciable light propagation within said fiber toward said fiber end;

second means for projecting light from said optical fiber end onto a plane, said second means having a numerical aperture for accepting and projecting light rays at angles corresponding to light emerging from said cladding at said optical fiber end and for rejecting light rays at angles corresponding to rays emitted from said core at said optical fiber end, the projected light pattern in said plane having substantially the shape of an annulus;

and third means for measuring deviations in light projected onto said plane with respect to the measured light value corresponding to the location of said annulus when said optical fiber is accurately aligned laterally in two mutually orthogonal coordinates in the plane of said fiber end.

4,215,938
METHOD AND APPARATUS FOR CORRECTING THE ERROR OF A POSITION MEASURING INTERFEROMETER

Clair L. Farrand, Bronxville; Vincent F. Foster, New Rochelle, and William H. Grace, Thornwood, all of N.Y., assignors to Farrand Industries, Inc., Valhalla, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,465
Int. Cl.[3] G01B *11/02*
U.S. Cl. 356—358 **4 Claims**

1. Interferometric apparatus having measuring and monitoring beams of light, said apparatus comprising:

(a) a first interferometer through which said measuring beam of light is directed, said first interferometer having a light path whose length through the environment can be varied by moving an associated first reflector with respect to the other first interferometer components;

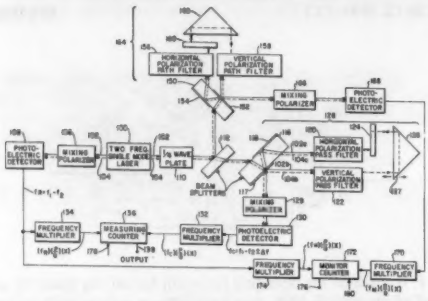
(b) first measuring means associated with said first interferometer for the measurement and indication of the measuring light path distance between said first reflector and said other first interferometer components;

(c) a second interferometer through which said monitoring beam of light is directed, said second interferometer having a light path whose length through the environment is fixed and predetermined by fixing an associated second

reflector with respect to the other second interferometer components;

(d) said measuring means associated with second interferometer for the measurement and indication of the monitoring light path distance between the second reflector and said other second interferometer components;

(e) means for accumulating the change over a period of time of the monitoring light path distance as measured by said second measuring means, said change being caused by variation of the environment of said apparatus; and



(f) correction means responsive to said accumulating means and connected to said first measuring means for correcting said indicated measuring light path distance by multiplying said indicated measuring light path distance by a correction factor corresponding to said fixed, predetermined distance divided by the sum of said fixed, predetermined distance and said change of said monitoring light path distance.

4,215,939

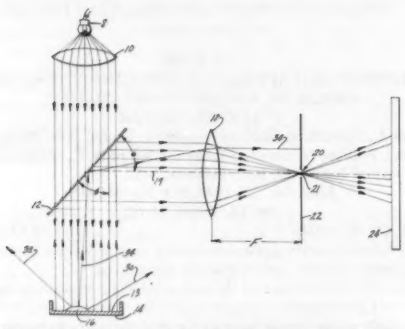
GLUE DROP DETECTOR

John W. V. Miller, Toledo, and James A. Ringlien, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1977, Ser. No. 863,201

Int. Cl.[2] G01B *11/30*; G01N *21/48, 21/32*

U.S. Cl. 356—371 **11 Claims**



1. A method for determining whether a glue drop is present on the inside of a closure comprising the steps of:

(a) projecting collimated light through a beam splitter and onto the generally flat reflective inside surface of a closure, said beam splitter being positioned so that it receives reflections from said closure inside surface; and

(b) measuring the amount of light which remains collimated after reflection from the inside closure surface, with a relatively greater amount of light remaining collimated after reflection when a glue drop is not present.

4,215,940

OPTODE ARRANGEMENT

Dietrich W. Lübbers, Dortmund, and Opitz, Norbert, Bochum, both of Fed. Rep. of Germany, assignors to Max Planck Gesellschaft zur förderung der Wissenschaften E.V., Göttingen, Fed. Rep. of Germany

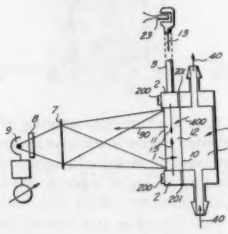
Filed Jul. 19, 1977, Ser. No. 817,109

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1976, 2632556

The portion of the term of this patent subsequent to Jan. 18, 1994, has been disclaimed.

Int. Cl.[2] G01J *3/46*

U.S. Cl. 356—402 **7 Claims**



1. An apparatus for the optical measurement of concentrations of components of a substance to be analyzed, of the type comprised of a source of monochromatic excitation radiation, an indicator chamber containing an indicator into which the monochromatic excitation radiation enters to excite the indicator, the side of the indicator chamber to be contacted by the substance to be analyzed being closed off by a membrane permeable for the component whose concentration is to be determined, the side of the indicator chamber through which radiation emitted from the indicator is to be emitted being transmissive for the emitted radiation, and a light-measuring unit operative for receiving the radiation emitted from the indicator and generating a corresponding signal indicative of the concentration of the component whose concentration is to be determined, the improvement wherein the travel path of the radiation emitted from the indicator to the light-measuring unit extends at an angle relative to the travel path of the monochromatic excitation radiation passing through the indicator chamber.

4,215,941

METHOD AND APPARATUS FOR RECYCLING ASPHALT-AGGREGATE COMPOSITIONS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Division of Ser. No. 864,673, Dec. 27, 1977, Pat. No. 4,177,080, which is a continuation-in-part of Ser. No. 718,063, Aug. 26, 1976, Pat. No. 4,182,631. This application Feb. 16, 1979, Ser. No. 12,657

The portion of the term of this patent subsequent to Feb. 14, 1993, has been disclaimed.

Int. Cl.[2] B28C *5/46*

U.S. Cl. 366—25 **6 Claims**

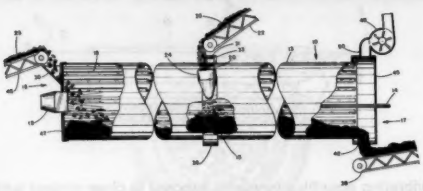
1. Apparatus for heating and mixing asphalt-aggregate composition comprising

(a) an elongated rotatable drum having an input end and an opposite output end,

(b) means for supplying hot gases of combustion at said input end and for directing said hot gases substantially along the length of said drum between said input and said output ends whereby said composition is gradually heated therebetween,

(c) first means for supplying aggregate particles into said drum at a hot zone whereby said aggregate is directly exposed to said hot gases,

(d) second means for introducing asphaltic concrete particles comprising a mixture of asphalt and aggregate to said drum in a cooler zone whereby said asphaltic concrete is directly exposed to said hot gases in said cooler zone, and



(e) means for recovering heated and mixed composition at said output end.

4,215,942

KNEADING DISC FOR A SCREW EXTRUDER

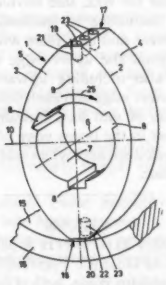
Wilhelm Seufert, Korntal; Gerhard Gnädig, Ditzingen; Fritz Przybylla, Heilbronn; Wolfgang Christen, Hemmingen, and Albert Grimminger, Leonberg, all of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1978, Ser. No. 952,048

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 2750767

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—343 **8 Claims**



1. A kneading disc for a screw-type extruding machine, the disc having a central longitudinal axis and comprising a kneading body of given width, given material and having a region of maximum operating stress, and at least one wear-resistant insert placed fixedly in a form-fitting recess in said body of the disc in said region of maximum operating stress so as to be substantially surrounded by said given material of said kneading body, wherein the geometrical shape of said at least one insert has straight and mutually parallel outer surfaces and is placed in a correspondingly configured recess in said body of the kneading disc, said configured recess constituting said form-fitting recess, and wherein said at least one recess extends parallel to said central longitudinal axis and completely across said given width of said kneading body.

4,215,943

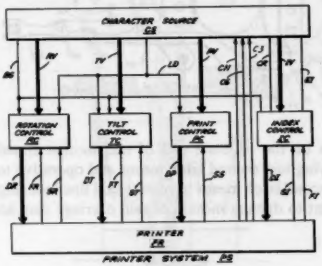
MOTOR DRIVEN SINGLE ELEMENT PRINTER

Edward H. Lau, Old Westbury, N.Y., assignor to Redactron Corporation, Hauppauge, N.Y.

Continuation-in-part of Ser. No. 650,414, Jan. 19, 1976, which is a continuation of Ser. No. 492,692, Jul. 29, 1974, abandoned. This application Jun. 21, 1978, Ser. No. 917,554

Int. Cl.² B41J *1/60*

U.S. Cl. 400—161.1 **2 Claims**



2. A printer comprising a platen, a print head, said print head having a print element upon which are type characters, said characters being grouped in a plurality of sets according to size, positioning means for selectively moving said print element to position a particular type character operatively opposite said platen for printing, a rocker means for supporting said print element, a cam follower connected to said rocker means, and means for mounting said rocker means to pivot so that said print element can move against said platen, a drive shaft, a cam on said drive shaft and operatively cooperative with said cam follower so that as said drive shaft rotates through a single rotational cycle said print element is driven toward said platen, a motor means when energized uni-directionally rotating said drive shaft through a single rotational cycle at selectively different speeds, and control means for energizing said motor means to rotate said drive shaft during one portion of each rotational cycle at a first speed in accordance with the character to be printed and the character just printed so that both the time between the printing of successive characters and the accelerations and decelerations of the motor are minimized and during another portion of the same rotational cycle at a different speed selected in accordance with which of the sets of said plurality the character to be printed belongs.

4,215,944

SINGLE KEYLEVER MULTIPLE ACTION CONTROL FOR TYPEWRITERS

Helmut Gottsmann, and Günter Scheinpflug, both of Nuremberg, Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Apr. 21, 1978, Ser. No. 898,956

Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720963

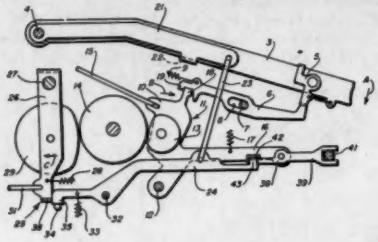
Int. Cl.² B41J *5/28*

U.S. Cl. 400—314 **2 Claims**

1. In a typewriter having a power roll, a cam drivable carriage return action, a cam drivable line indexing action, means biasing said actions toward engagement with and for driving engagement by said power roll, first and second rotatable latch means for respectively releasably holding said carriage return and line indexing actions from engagement with said power roll, a carriage return line indexing keylever, and linkage associated with said keylever for rotating said first latch means to release said carriage return action upon depression of said keylever; the improvement comprising

a motion transfer link rotatably connected intermediate its ends to said cam driven carriage return action,

means supporting one end of said motion transfer link about a fixed pivot, and



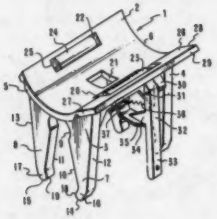
an offset on the opposite end of said motion transfer link overlying said second latch means and operative to rotate said second latch means to release said line indexing action incident to driving motion of said carriage cam action.

4,215,945

PAPER FEEDING APPARATUS

Adolph B. Habich, and Ronald E. Hunt, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,361
Int. Cl.³ B41J *13/04*
U.S. Cl. 400—636 **10 Claims**



1. Apparatus for facilitating the feeding of paper about a printer platen, said apparatus comprising:

(a) yoke means for effecting rotation of said apparatus in a first and a second direction;

(b) channel means connected to said yoke means for accommodating said platen; and

(c) first and second feed means carried by said channel means for selectively cooperating with said paper and said platen upon rotation of said apparatus in said first and second directions.

4,215,946

IMPACT RECEIVING STRUCTURE FOR IMPACT TYPE PRINTING MECHANISM

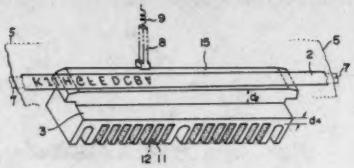
Satoru Nakabo, Tokyo; Tasaku Wada, Naritanishi, and Kazumasa Mihira, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1978, Ser. No. 872,819
Claims priority, application Japan, Feb. 1, 1977, 52-9281
Int. Cl.² B41J *29/02*
U.S. Cl. 400—689 **6 Claims**

1. An impact receiving structure for receiving impact by printing hammers in a printing mechanism, comprising:

impact receiving face means for receiving impact by said printing hammers;

vibration members coupled as a unitary structure to said impact receiving face means for guiding by branched paths vibration caused in said impact receiving face means by said impact; and



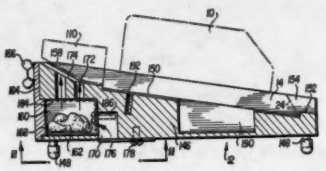
vibration absorbing members disposed in close contact with said vibration members for absorbing said vibration.

4,215,947

SKI SERVICING AND REPAIRING TOOL

James D. Sparling, 1680 Adams St., Apt. #1, Denver, Colo. 80206

Division of Ser. No. 663,973, Mar. 4, 1976, Pat. No. 4,089,076.
This application Feb. 15, 1978, Ser. No. 877,857
Int. Cl.² A63C *11/08*
U.S. Cl. 401—125 **6 Claims**



1. A device for supporting and heating a ski servicing tool of the type having a base plate with a substantially planar lower surface, a handle attached to said base plate, and a wax dispenser extending laterally from one edge of said base plate and including a reservoir for wax, said device comprising:

a support base including an inclined supporting surface adapted to receive said base plate with said wax dispenser projecting beyond the upper edge of said surface, said support base also including upwardly extending walls adjacent the lower edge and each side of said surface; and

a lateral extention of said base housing a heat source and located adjacent to the upper edge of said surface so as to underly said wax dispenser when said tool is positioned on said support base.

4,215,948

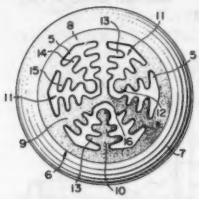
SYNTHETIC RESIN ROD WITH A MULTIPLICITY OF CAPILLARY PASSAGES

Itsuo Horie, and Yoshihiro Wada, both of Soka, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1978, Ser. No. 894,520
Claims priority, application Japan, Apr. 7, 1977, 52-42623
Int. Cl.² B43K *8/00*
U.S. Cl. 401—265 **7 Claims**

1. A rod extruded from a synthetic resin material comprising: an outer cylindrical shell having a center axis; at least three stationary ribs equi-angularly spaced apart and extending radially inward from the inner wall of the shell to the center axis thereof and joined together on the center axis, the stationary ribs defining within the shell and between them a plurality of axially extending, independent compartments of substantially equal volume; and a movable rib in each compartment and extending radially inward from the inner wall of the shell toward the center axis and having its free end located within the associated compartment; each of the stationary and mov-

able ribs having along its length a plurality of wings each comprised of a pair of symmetrical projections projecting from the opposite sides of the rib, the plurality of wings on each rib being disposed circumferentially on concentric circles centered on the center axis and being circumferentially separated



so as to define spaces of approximately equal size between adjacent wings, the free end of each movable rib being formed as a bulging end which has a circular transverse cross section, the bulging ends of the movable ribs being disposed on a common circle centered on the center axis.

4,215,949

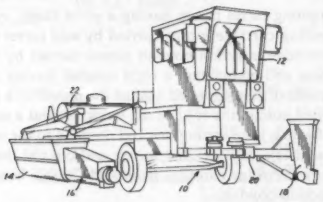
SELF CONTAINED ASPHALT PATCHING APPARATUS

Gifford W. Gabriel, Jr., 8198 S. Marshall, Littleton, Colo. 80123

Filed Nov. 24, 1978, Ser. No. 963,215

Int. Cl.² E01C *19/06*

U.S. Cl. 404—110 **15 Claims**



1. In a wheeled asphalt patching machine having an elevatable supply hopper for asphalt and a transfer bucket on an articulated arm, and including tamper means and burner means, tack oil spray, mounted on and movable with the bucket, and auger means extending from internally of the supply hopper to a supply position for the bucket, the improvement of:

(a) open top trough means housing the auger means and extending from the supply hopper to the supply position for the bucket,

(b) a height adjustable frame assembly mounted on the bucket carrying said burner means,

(c) lower outlet means for said bucket including release means and spreading means for asphalt from the transfer bucket, and

(d) adjustable height frame means carrying the tamper means mounted on the bucket.

4,215,950

TENSIONER DEVICE FOR OFFSHORE OIL PRODUCTION AND EXPLORATION PLATFORMS

William D. Stevenson, Edinburgh, Scotland, assignor to Brown Brothers & Company, Ltd., Edinburgh, Scotland

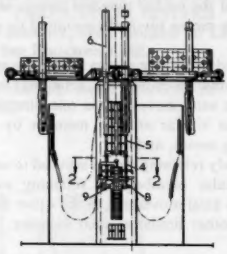
Filed Apr. 24, 1978, Ser. No. 899,478

Claims priority, application United Kingdom, Apr. 23, 1977, 17001/77

Int. Cl.² B63B *21/52, 51/02*

U.S. Cl. 405—195 **11 Claims**

1. A tensioner device for suspending and guiding a production riser in an oil production platform structure comprising a gimbal device having an inner ring and an outer ring to which the inner ring is pivoted so as to be swingable about an axis which is diametrically disposed with respect to both rings, a clamping device carried by the inner ring and arranged to be clamped to a production riser, guiding means pivotally attached to the outer ring of the gimbal device at diametrically opposite points on the ring so as to be swingable about an axis which is disposed diametrically of the outer ring and is at right angles to the axis about which the inner ring is swingable, said guiding means being operative to guide the gimbal device in



the platform structure in a direction at right angles to the axis about which the guiding means are swingable, and at least one pair of tensioner units each incorporating a cylinder and piston as relatively movable elements, one said element of each unit of the pair being pivoted to the inner ring at a point diametrically opposite to the point where the corresponding element of the other unit of the pair is pivoted to the inner ring, and the other elements of both units being connectible to the platform structure.

4,215,951

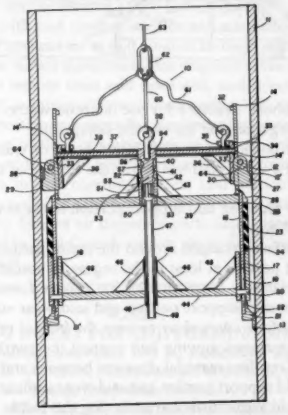
PLATFORM LEG PLUG

Lloyd C. Knox, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Aug. 26, 1977, Ser. No. 828,065

Int. Cl.² E02B *17/00*

U.S. Cl. 405—203 **22 Claims**



1. A removable plug for temporarily sealing the interior of the leg of an offshore platform or other similar annular member, said removable plug comprising:

plug body means disposed within said leg or other similar annular member, said plug body means comprising:

packer mandrel means;

packer member means located on said packer mandrel means;

packer setting sleeve means, the packer setting sleeve means including;

packer setting sleeve mandrel means;

support means having the packer setting sleeve mandrel means centrally located therein; and

outer cylindrical member means secured to the support means by pin means extending through slots in the packer mandrel means and located adjacent the outer surface of the packer mandrel means; and

locking dog means pivotally mounted on said plug body means;

upper plug body retaining means secured to said leg or other similar annular member for retaining said plug body means from axial movement in one direction within said leg or other similar annular member by engaging said locking dog means; and

lower plug body retaining means secured to said leg or other similar annular member for retaining said plug body means from axial movement in the other direction within said leg or other similar annular member.

4,215,952

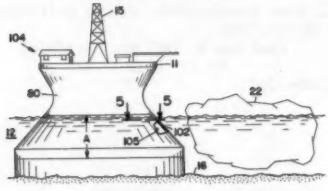
OFFSHORE STRUCTURE FOR USE IN WATERS CONTAINING LARGE MOVING ICE MASSES

Per Baardsen, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 15, 1978, Ser. No. 886,844

Int. Cl.[2] E02B *15/02*

U.S. Cl. 405—211 **16 Claims**



1. An offshore structure for use in arctic waters containing relatively large moving ice masses, comprising:

a support portion extendible into a body of water for supporting a work platform above the surface of the body of water;

means for securing said support portion to the bottom of the body of water;

a wear surface arranged around the entire periphery of said support portion at least in the region of potential contact with relatively large moving ice masses forming a void between said support portion and said wear surface, said wear surface adapted to receive the impact of relatively large ice masses moving into contact therewith; and

a layer of resilient material disposed between and in contact with said support portion and said wear surface filling said void, said wear surface transferring the forces associated with the impinging ice mass to said resilient material so that said resilient material deflects when said wear surface is impacted by the relatively large moving ice mass and said resilient material of sufficient thickness to substantially reduce the forces imposed on the support portion by the moving ice mass.

4,215,953

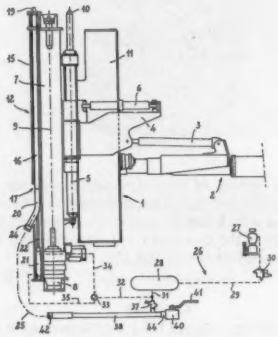
DEVICE FOR INJECTING CARTRIDGES OF RESIN FOR BOLTING APPARATUS

Raymond J. Perraud, Villeurbanne, France, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Aug. 30, 1978, Ser. No. 938,139

Int. Cl.[2] E21C *11/00*

U.S. Cl. 405—303 **8 Claims**



1. A cartridge injecting device for roof bolting apparatus for propping the roof of a working such as a mine gallery, comprising:

(a) pivoting turret means having a pivot shaft;

(b) drilling carriage means carried by said turret means;

(c) cartridge injection conduit means carried by said turret means and comprising a rigid conduit having a first end capable of being applied against the mouth of a previously drilled hole in the roof of the working, and a second end;

(d) a flexible hose having one end coupled to the second end of said injection conduit means and coaxial therewith so that a cartridge can pass from said flexible hose into said injection conduit;

(e) cartridge receiving tube means remote from the turret means and into which cartridges may be initially introduced, said flexible hose having its other end connected to said cartridge receiving tube means so as to be coaxial therewith; and

(f) a source of compressed air connected to said cartridge receiving tube means.

4,215,954

WORKPIECE DISENTANGLER

Vivian C. George, Walsall; Cyril J. Webb, Birmingham, and Roy Whitmore, Brereton, all of England, assignors to Concentric Production Research Limited, Sutton Coldfield, England

Filed Jul. 25, 1978, Ser. No. 927,756

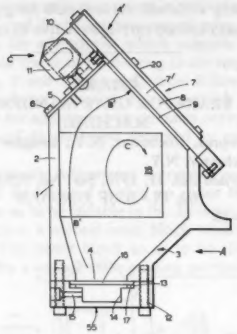
Claims priority, application United Kingdom, Jul. 26, 1977, 31239/77

Int. Cl.[2] B65G *51/02*

U.S. Cl. 406—137 **10 Claims**

1. Apparatus for disentangling elongate workpieces of the kind which tend normally to become interengaged or entangled comprising a container defining a chamber, inlet means for introducing air under pressure into the chamber, outlet means through which workpieces pass from said chamber, means to enable workpieces to be introduced into the chamber in bulk, first and second relatively slidable plates of said outlet means held in face contact with each other, said first plate being formed with a first series of slots, and said second plate being formed with a second series of slots each of which overlaps with a respective parallel slot of said first series, whereby

the overlapping parts of said first and second series of slots define a third series of slots of adjustable width substantially



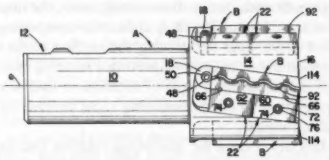
equal to the transverse dimension of the workpieces to be dispensed.

4,215,955

CUTTING TOOL AND INSERT FOR SAME

Charles R. Lillie, Rogers, Ark., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 11, 1978, Ser. No. 950,380
Int. Cl.³ B26D *1/12*
U.S. Cl. 407—42 **5 Claims**



1. A cutting tool insert adapted for mounting on a cutting tool holder in a manner such that a cutting edge on said insert extends radially outward of said tool holder over a longitudinal extend thereof, said insert comprising:

an insert body having a longitudinal axis, a substantially flat bottom surface adapted to locate said insert in a desired position on said tool holder and a cutting edge spaced from and extending generally logitudinally of said bottom surface, said cutting edge being defined by the intersection of a cutting face and a land area which tapers from said cutting edge toward said bottom surface with said cutting face disposed to define a neutral rake angle when said insert is mounted on a tool holder, said cutting edge having a substantially straight line configuration over the length thereof as viewed in a direction normal to said cutting face with said cutting face including a plurality of alternating arcuate peak areas extending outwardly therefrom and arcuate valley areas extending inwardly thereinto substantially laterally thereacross for defining a generally sinusoidal cutting edge configuration along the surface of said cutting face, and said peak areas having a radius greater than the radius of said valley areas at least at said cutting edge,

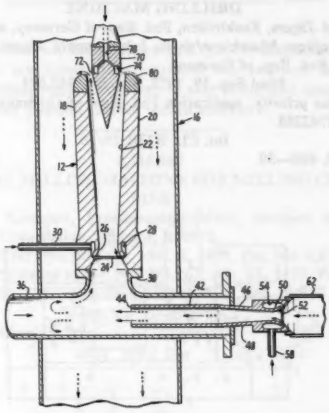
said insert body includes a pair of opposed side faces and a pair of opposed end face areas upstanding from said bottom surface, said insert body further having a connecting wall extending between said cutting face and one of said side faces at an area spaced from said cutting edge toward said bottom surface, said cutting face and cutting edge extend axially outward from said insert body at one of said end areas, said one end area including a first end portion defining a plane which at a first angle from the outermost end of said cutting edge back toward the other of said side faces and at a second angle from said cutting edge outermost end back toward said bottom surface, said first angle being greater than said second angle when measured between a plane disposed transverse and normal to said bottom surface and the plane of said first end portion.

4,215,956

SYSTEM FOR DISPERSING AND TRANSPORTING PARTICULATE MATTER

Imants Reba, Vancouver, Wis., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Feb. 14, 1979, Ser. No. 12,178
Int. Cl.³ B65G *53/14, 53/42*
U.S. Cl. 406—152 **12 Claims**



1. Apparatus for dispersing and transporting particulate matter comprising in combination:

a conduit having an interior and an open end in communication with the ambient atmosphere;

a Coanda nozzle defining a flow path in fluid flow communication with said conduit interior and adapted to induce a flow of ambient air in said conduit through said open end;

particulate matter injection means disposed in the end of said conduit remote from said open end, said injection means adapted to introduce particulate matter into said conduit in a direction substantially diametrically opposed to the direction of flow of ambient air in said conduit, said Coanda nozzle being positioned in close proximity to the location in said conduit whereat said particulate matter impinges against said ambient air in said conduit interior whereby flow of air dispersed particulate material will be induced by said Coanda nozzle along said Coanda nozzle flow path.

4,215,957

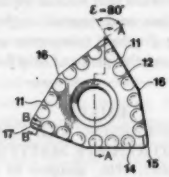
CUTTING INSERT FOR CHIPFORMING MACHINE

Johan E. Holma, Sandviken; Ake A. Andersson, Kungsgarden, and Nils L. Gavlefors, Sandviken, all of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Sep. 19, 1978, Ser. No. 943,641
Claims priority, application Sweden, Sep. 17, 1977, 7710434
Int. Cl.² B26D *1/12*
U.S. Cl. 407—114 **9 Claims**

1. A cutting insert for use in the chipforming machining of workpieces, said insert comprising a rake face and a clearance face, at least one cutting edge formed by the intersection of the

rake and clearance faces, said cutting edge being intersected by spaced depressions extending along said rake face, the depth of each depression initially increasing in a direction away from said cutting edge and thereafter decreasing in said direction.



4,215,958

DRILLING MACHINE

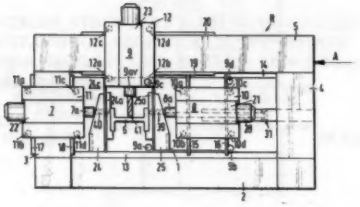
Leopold Jägers, Euskirchen, Fed. Rep. of Germany, assignor to Trennjäger Maschinenfabrik, Inh. Leopold Jägers, Euskirchen, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,694

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742258

Int. Cl.² B23B *39/16*

U.S. Cl. 408—38 **17 Claims**



1. A drilling machine for working on workpieces having a longitudinal axis longer than its transverse and horizontal axis, said machine comprising a frame including a horizontal machine underpart arranged transversely to said longitudinal axis, first and second vertical side parts spaced from each other and connected with the ends of said machine underpart, and a horizontal machine upper beam attached to said side parts; first, second and third drilling units, each said drilling unit including a drilling spindle, a gear and a motor, each said drilling unit being shiftable in a plane parallel to said frame and perpendicular to said longitudinal axis, said first drilling unit being attached to said first vertical side part and having its drilling spindle horizontally directed towards one side of the workpiece, said second drilling unit being attached to said second vertical side part and having its drilling spindle horizontally directed in a direction opposite to that of said first drilling unit towards another side of the workpiece, opposite to the one side of the workpiece, and said third drilling unit being attached to said upper beam and having its drilling spindle vertically directed between said two horizontally directed spindles, the improvement comprising:

at least one first rail attached to said machine underpart;

at least one second rail attached to said upper beam;

a first, horizontally driven, carriage including lower wheels and upper wheels, said second drilling unit and said second drilling spindle being movably coupled with and to said first, horizontally driven, carriage;

said lower wheel being operatively associated with said first rail, and said upper wheels being operatively associated with said second rail, said wheels and said rails guiding said carriage for movement therealong;

vertical rails on said first carriage;

a second, vertically running, carriage associated with and carried by said first carriage and carrying said second drilling unit; and,

second wheels associated with said second carriage and cooperating with said vertical rails for guiding the movement of said second carriage relative to said first carriage.

4,215,959

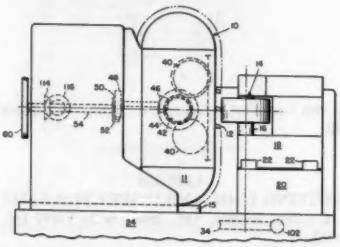
DRIVE TRAIN FOR GEAR MANUFACTURING MACHINE

Thomas A. Deprez, Rochester, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Jul. 31, 1978, Ser. No. 929,600

Int. Cl.² B23F *5/20, 5/28*

U.S. Cl. 409—10 **6 Claims**



1. In gear manufacturing apparatus of the type in which a series of stock removing tools are carried on a driven endless chain means so that the tools can be brought into working engagement with one or more workpieces, the improvement in a drive train layout for such apparatus comprising

a first drive train for driving the endless chain means

a second drive train for imparting a rotating motion to workpieces about their axes of rotation as said workpieces are presented to stock removing tools carried by the endless chain means,

a third drive train for imparting relative translating motion between the endless chain means and the workpieces,

a main drive motor operatively connected to said first drive train for imparting controlled driving motion to the endless chain means,

a reversible drive motor which can be selectively connected to or disconnected from said second and third drive trains,

first coupling means for selectively (a) connecting said second drive train to said main drive motor for establishing a timed relationship between the driving of said stock removal tools carried by the endless chain means and the rotating of said workpieces, or (b) disconnecting said second drive train from said main drive motor so that the second drive train can be driven by said reversible drive motor independently of the driving of said first drive train by the main drive motor, and

second coupling means for selectively coupling said second drive train to said third drive train to thereby impart a relative translating motion between said endless chain means and said workpieces.

4,215,960

COPYING-MILLING APPARATUS

Yoshihiko Tsuzuki, Nagoya, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 805,335, Jun. 10, 1977, abandoned, which is a continuation of Ser. No. 708,623, Jul. 26, 1976, abandoned. This application Feb. 27, 1978, Ser. No. 881,695

Int. Cl.² B23C *1/16;* **B23Q** *35/20, 35/30*

U.S. Cl. 409—121 **2 Claims**

1. A copying-milling apparatus for a three-dimensional free

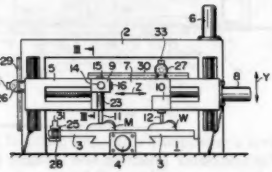
curved surface having a tracer and a cutter adapted to follow said tracer, said copying-milling apparatus comprising:

detectors which detect amounts of displacement of said tracer from preset reference points in individual directions of axes X, Y and Z of Cartesian coordinates;

a drive device for adjustment which subjects one of said cutter and said tracer to positioning in the respective axial directions X, Y and Z separately from follow-up motion;

first, second and third control devices which actuate said drive device for adjustment by amounts corresponding to the amounts of displacement detected by said detectors; and

said drive device for adjustment comprises a a first inner block which is disposed within an outer block of said tracer unit so as to be slidable in the direction X by a slide guiding portion, a second inner block which is disposed within said first inner block so as to be slidable in the direction Z by a second slide guiding portion, and a third



inner block which is disposed within said second inner block so as to be slidable in the direction Y by a third slide guiding portion and to which said tracer and a control signal generating portion therefor and secured; said first, second and third inner blocks define first, second and third spaces in the respective sliding directions with respect to said outer block, first inner block and second inner block in which the respective blocks are disposed; said first inner block is threadably engaged with a threaded shaft of said first control device as secured to said outer block, said second inner block is threadably engaged with a threaded shaft of said second control device as secured to said first inner block, and said third inner block is threadably engaged with a threaded shaft of said third control device as secured to said second inner block; and said first, second and third inner blocks are respectively moved forwards and backwards in the directions X, Y and Z within ranges of said first, second and third spaces by control devices.

4,215,961

LOCKING MECHANISM FOR THE MANDREL COLLAR ON MILLING AND DRILLING SPINDLES

Werner Babel, Pfronten-Meilingen, Fed. Rep. of Germany, assignor to Maho Werkzeugmaschinenbau Babel & Co., Achweg, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,374

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 7729164[U]

Int. Cl.[2] B23C *9/00*; B23Q *1/28*

U.S. Cl. 409—231 **2 Claims**

1. A tightening apparatus for a mandrel collar of a milling or boring spindle, said apparatus comprising:

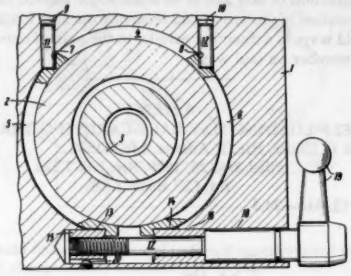
a spindle housing having a central bore therein, a circumferential groove around said bore and at least two spaced holes intersecting said bore;

a mandrel collar extending into said bore;

a pair of arcuate clamping elements retained by said circumferential groove within said bore, each said clamping element having a notch adjacent one end thereof;

retainer pin means in each of said spaced holes engaging said notches to prevent circumferential movement of said clamping elements; and

means for engaging the other ends of said clamping elements and forcing said other ends toward each other thereby gripping the outer surface of said mandrel collar, said engaging means and said retainer pins being disposed about the circumference of said mandrel collar so as to



apply force on said mandrel on angularly displaced zones which are substantially opposite one another, thereby minimizing radial distortion of said collar and insuring a centered position thereof within said bore.

4,215,962

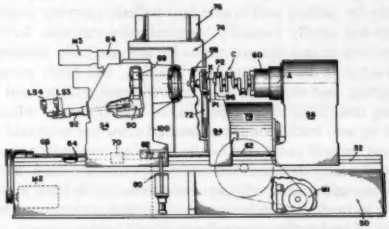
INTERNAL MILLING MACHINE FOR MILLING CRANK PINS

David L. Kreucher, Frankenmuth, Mich., assignor to The Wickes Corporation, Saginaw, Mich.

Division of Ser. No. 883,809, Mar. 6, 1978, Pat. No. 4,171,654, which is a division of Ser. No. 764,067, Jan. 31, 1977, Pat. No. 4,099,431. This application May 9, 1979, Ser. No. 37,525

Int. Cl.[3] B23C *3/08*

U.S. Cl. 409—241 **2 Claims**



1. In a machine tool having a frame, a set of ways mounted on said frame, an indexable member mounted on said ways for movement thereon between selected positions on said ways, and locking means for locking said member against movement from a selected position on said ways; the improvement wherein said locking means comprises a shot pin mounted on said frame for axial movement along a path normal to said ways between a retracted position and an extended position, said shot pin having a tapered end section, seating means on said member defining a receiving opening tapered complementary to said end section of said shot pin with the axis of said receiving opening extending in a direction parallel to the axis of said shot pin and being adapted to receive said shot pin when said shot pin is moved to its extended position, power means operable when said shot pin and said receiving opening are in an approximate alignment such that said pin can enter said receiving opening for driving said shot pin between its retracted position and its extended position in a seated engagement in said receiving opening wherein said pin and said receiving opening are in precise coaxial alignment with each other, the complementally tapered portions of said pin and

receiving opening being operable during movement of said pin to its extended position to shift said member on said ways as required to achieve said coaxial alignment, and movable and lockable positioning means provided on the frame to move in the direction of said axis at an acute angle thereto for shifting the location of the axis of said receiving opening longitudinally of said ways in a direction parallel to the path of movement of said member on said ways.

4,215,963

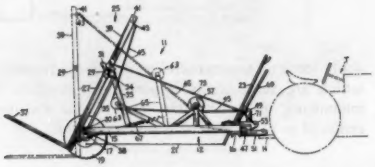
SELF-LOADING HAY-BALE-CARRYING TRAILER

Ralph L. Doner, Rte. 2, Atlanta, Mo. 63530

Filed Jan. 26, 1979, Ser. No. 7,226

Int. Cl.[2] B60P *1/08*

U.S. Cl. 414—24.5 **8 Claims**



1. A self-loading hay-bale-carrier trailer comprising: a relatively rigid chassis, a pair of wheels supporting said chassis and being mounted on axle means close to the rear end of said chassis, brake means for preventing undesired chassis movement, a tiltable V-shaped bale-holder cradle pivotally attached to the rear of said chassis on an axis close to and parallel to the axis of said axle means, said cradle being swingable to cause its rear portion to lie close to ground level for back-up sliding under a hay-bale and said cradle being swingable upwardly and forwardly into bale-carrying position, automatic means for latching and holding said cradle in its bale-carrying position, a cable for pulling said cradle into its bale-carrying position, a draw-bar axially limitedly longitudinally movable forwardly relatively to said chassis, means for automatically latching said draw-bar in its non-extended position, and hitch means for coupling said draw-bar to a conventional tractor, said cable being connected to the front end of said draw bar, whereby a pull by said tractor on the unlatched draw bar with said brake means set will cause said cradle to swing upwardly toward its automatically latched bale-carrying position and whereby backing said tractor will cause said draw bar to latch automatically in its non-extended position for bale-transporting movement of said trailer after release of said brake means.

4,215,964

BALE-ACCUMULATING TRAILER

Thomas G. Schrag, Newton; Amos G. Hill, and Howard R. Lohrentz, both of Hesston, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Dec. 14, 1977, Ser. No. 860,152

Int. Cl.[2] A01D *87/12*; B65G *57/32*

U.S. Cl. 414—111 **3 Claims**

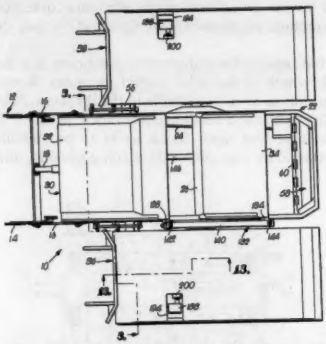
1. In a bale-accumulating trailer for use in conjunction with a baler from which bales are successively discharged, said trailer having a first station disposed to receive said bales as they issue from the baler, a second station spaced and separate from said first station, and a transfer device normally operable in response to arrival of a bale at said first station to move the arrived bale from said first to said second station, the improvement comprising:

mechanism sensitive to the presence of an existing bale at said second station for preventing said operation of said device,

said mechanism including a bale-engaging element shiftable into and out of a position preventing operation of said device and located in disposition to be shifted to said position by a bale arriving at said second station,

said second station being tiltable out of a generally horizontal attitude for dumping a bale therefrom;

means for holding said first station against tilting with said second station such that the second station tilts relative to the first station;



means for releasably retaining said element in said position thereof during said tilting of the second station; and

means for releasing said element from said retaining means and for shifting said element out of said position only upon complete return of said second station of said horizontal attitude whereby to thereupon cause operation of the device to clear said first station.

4,215,965

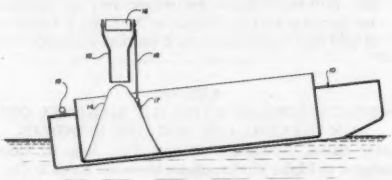
APPARATUS AND METHOD FOR LOADING A FLOATING VESSEL WITH FLOWABLE MATERIAL

Ward H. Parsons, 1202 Green Glen Rd., Birmingham, Ala. 35216

Filed Nov. 6, 1978, Ser. No. 957,732

Int. Cl.[2] B63B *27/00*

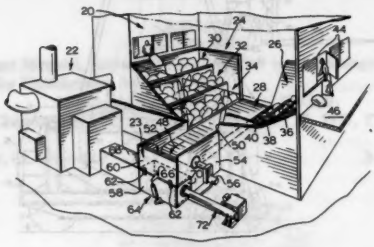
U.S. Cl. 414—139 **10 Claims**



1. A method of loading a floating vessel with flowable material comprising delivering flowable material into the vessel near one end of the vessel and sensing the level of the material in the vessel to thereby activate a means to cause a relative movement between the vessel and said material delivery means in the end-to-end direction of the vessel, repeating the delivery of the flowable material and the sensing of the level of the material at incremental locations along the vessel until the vessel is loaded from end-to-end to a desired level of the flowable material, simultaneously during the progressive loading of the vessel from end-to-end sensing the degree of list of the vessel in an end-to-end plane caused by said loading and thereby producing an electrical signal in proportion to the degree of list of the vessel and changing the magnitude of the electrical signal in accordance with diminishing list of the vessel as the loading of the vessel progresses to completion where the vessel is level, and then producing a separate and final electrical signal indicative of the level state of the fully

loaded vessel and utilizing such final signal to terminate the delivery of flowable material into the vessel.

4,215,966
MATERIAL HANDLING APPARATUS
Kenneth R. Cooper, Don Mills, Canada, assignor to Canada Square Management Ltd., Toronto, Canada
Filed May 15, 1978, Ser. No. 905,823
Int. Cl.[2] B65G 3/04
U.S. Cl. 414—173 **8 Claims**

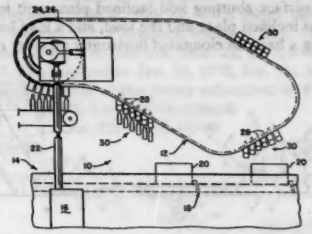


1. Material handling apparatus comprising a series of material receiving bins, each comprising: substantially rigid front, rear and side walls arranged in generally upright positions and defining a generally upright space which is of uniform rectangular cross-sectional shape throughout its height and which has an open upper end through which material can be introduced into the bin; a substantially rigid platform of a rectangular shape dimensioned to fit closely within said walls of the bin, said platform forming a bottom wall of the bin and being movable with respect to said front, rear and side walls between a bottom position when the bin is empty and an upper position for ejecting material from the bin; and means for moving the platform between its said positions; the bins being disposed closely adjacent one another in a cascade arrangement in which the bins are of progressively increasing height with increasing distance from a discharge location so that material ejected from an upper bin in said series will tend to pass into an adjacent lower bin, and each of said platforms having a flat upper surface which is inclined with respect to the front and rear walls of the associated bin so as to slope towards said discharge location when the platform is in its upper position and form a closed top on the bin over which material ejected from a higher bin in said series can pass towards said discharge location, the platforms of all of the bins being arranged to co-operate when in their upper positions to form a generally flat inclined surface sloping towards said discharge location.

4,215,967
ADJUSTABLE APPARATUS FOR CASE LOADING AND UNLOADING
Robert W. McGill, Munroe Falls, and Michael E. Winiasz, Lorain, both of Ohio, assignors to A-T-O Inc., Willoughby, Ohio
Continuation of Ser. No. 879,130, Feb. 21, 1978, Pat. No. 4,147,265. This application Jan. 18, 1979, Ser. No. 4,305
Int. Cl.[2] B65G 65/38
U.S. Cl. 414—416 **12 Claims**

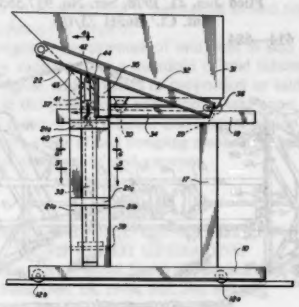
6. In an apparatus for article deposit and/or removal from carrier cases, the apparatus having a frame, positioning members extending transversely of the frame, article grippers depending from the positioning members, and a conveyor system operatively connected to and transporting the positioning members through an arcuate course, the improvement comprising:

a pantograph interconnected between the conveyor system and the positioning members, said pantograph being comprised of a plurality of links pivotally interconnected, said links being flexible out of a normal planar shape, and each



of said links comprise a plurality of superimposed individual plates.

4,215,968
CONTAINER-DUMPING MACHINE
Richard Rymer, 4128 E. Saxony Dr. SE., Grand Rapids, Mich. 49508
Filed May 25, 1978, Ser. No. 909,510
Int. Cl.[2] B65B 21/02
U.S. Cl. 414—421 **8 Claims**



1. In combination with a container, a container-dumping machine including a container receptacle, a frame, fulcrum means on said frame providing a pivotal support for said receptacle, and means for rotating said receptacle on said fulcrum means, wherein the improvement comprises:

means forming substantially vertical guideways on opposite sides of said frame, respectively; means forming a cam surface on said receptacle,

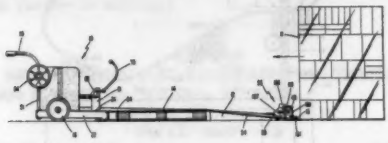
a carriage mounted for movement along said guideways, said carriage having bearing means including a cam follower normally engaging said cam surface at a position displaced from the axis of said pivotal support; and

drive means operative to induce movement of said carriage, and consequent rotation of said receptacle, said drive means, carriage, and guideways constituting said means for rotating said receptacle.

4,215,969
LOAD HANDLING APPARATUS
Theodore J. Puchalski, Jr., Mechanicsville, Va.; Robert J. Albrecht, River Edge, N.J., and Albert A. Pinto, White Plains, N.Y., assignors to Nabisco, Inc., East Hanover, N.J.
Filed Jul. 7, 1978, Ser. No. 923,651
Int. Cl.[3] B65G 65/04
U.S. Cl. 414—571 **10 Claims**

1. Apparatus for readying a slip-sheeted load resting on a

floor surface for transport by fork lift equipment comprising in combination an inclined plane unit to be placed on said surface adjacent the load to provide for said load an inclined plane extending upwardly from said surface, a pallet unit to be place on said surface abutting said inclined plane unit in alignment with said inclined plane and the load, and a load handling unit including a base, an elongated horizontal member mounted on



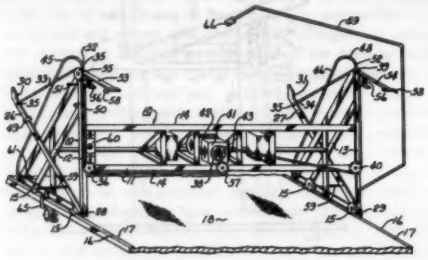
said base for engaging said pallet, means for maneuvering said load handling unit upon said surface to position said horizontal member against the side of the pallet unit opposite to the inclined plane, a clamp for engaging the slip sheet of the slip-sheeted load, and winch means mounted to said base including a cable element attached to said clamp to be extended from said load handling unit across the pallet unit and down the inclined plane to the load.

4,215,970

ROLL LOADER FOR ROLL MANIPULATING MACHINE

Eugene J. DeSalle, 216 Shawnee Ave., Monessen, Pa. 15062

Filed Jun. 21, 1978, Ser. No. 917,563
Int. Cl.[2] B65H *75/02*
U.S. Cl. 414—684 **12 Claims**



1. A roll loader for a roll manipulating machine comprising, a frame, a pair of horizontally spaced lifting arms mounted on said frame and adapted to receive a roll support shaft thereon for elevation, means to raise said arms in unison, a pair of horizontally spaced guide rails positioned to receive a roll support shaft in sliding or rolling engagement at a predetermined elevation while it is being elevated by said arms, said rails rise on an incline and crest to a terminating down slope to permit free transfer of a roll support shaft from said arms for free rolling down said rails, said rail down slopes terminating in bridge tracks which yield downwardly under the weight of a roll support shaft rolling from said rail down slopes onto said bridge tracks for transfer down onto an underlying roll shaft support of a roll manipulating machine.

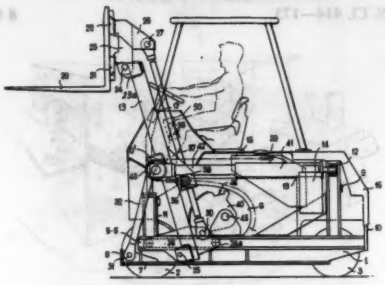
4,215,971

LIFT TRUCK

Georges Itey-Bernard, Garches, France, assignor to Regie Nationale des Usines Renault, Boulogne Billancourt, France

Filed Jun. 15, 1978, Ser. No. 915,889
Claims priority, application France, Jun. 29, 1977, 77 19913
Int. Cl.[2] B66C *23/00*
U.S. Cl. 414—696 **7 Claims**

1. In a lift truck of the type comprising a frame, a mast adapted to be pivoted in relation to said frame, a fluid-operated cylinder for controlling the ascent and descent of said mast, a load-supporting platform operatively connected with said mast, a movable slide block, a first pivot pin carried by a lower end of the mast and operatively connected with the movable slide block, the slide block being guided horizontally along the lower portion of the frame for controlling mast movements, the improvements comprising a positioning rod, said positioning rod having a pivot pin at a lower end thereof for pivotally connecting said rod to said slide block for positioning the rod



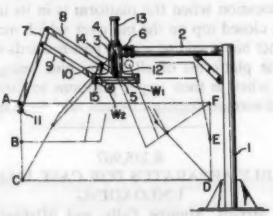
and the load supporting platform , a second pivot pin carried by an upper end of the mast and connected to the load supporting platform, and a supporting rod having a length equal to one-half of the distance between the first pivot pin of said mast on the slide block and the second pivot pin, said supporting rod being pivoted to said mast and to a lower portion of said frame ahead of said slide block, the frame including a pair of longitudinal side members for defining a guide race for the slide block controlling the mast movements.

4,215,972

TRANSFER MECHANISM EMPLOYING SWINGABLE ARM FORMED AS A PARALLELOGRAM LINKAGE

Akitoshi Yamasaki, Takatsuki, and Kajunori Miyauchi, Neyagawa, both of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Jun. 1, 1978, Ser. No. 911,497
Int. Cl.[2] B66C *23/04*
U.S. Cl. 414—742 **12 Claims**



1. Transfer apparatus comprising an object-suspending rod, upper and lower support rods whose one ends are pivotally connected to said object-suspending rod, and a connecting rod pivotally connecting said support rods adjacent the other ends thereof, said object-suspending rod and said connecting rod as well as said upper and lower support rods being disposed in parallel to constitute two pairs of opposite sides of a parallelogram link mechanism, an object hanger attached to the lowest end of said object-suspending rod, a vertically stationary support member having substantially vertical and transverse guide slots therein, a fluid-pressure cylinder device stationary mounted relative to said support member and having an extendible and contractible portion, the other end of said upper

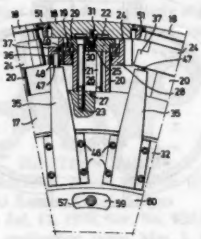
support rod being connected to a balance weight which is movably guided in said vertical guide slot so as to be movable up and down therein by the extendible and contractible portion of said cylinder device, a pivot shaft connecting the lower-support and connecting rods, the pivot shaft functioning as a fulcrum for permitting swinging of said parallelogram link mechanism relative to said support member and being guided for movement along said transverse guide slot in said support member, and another balance weight connected to the other end of said lower-support rod in spaced relation from said pivot shaft.

4,215,973

AXIAL FAN

Edgar Säterdal, Rottne, Sweden, assignor to Aktiebolaget Svenska Flätfabriken, Nacka, Sweden

Filed May 11, 1978, Ser. No. 905,029
Claims priority, application Sweden, May 17, 1977, 7705827
Int. Cl.[2] F04D 29/36
U.S. Cl. 416—172 **3 Claims**



1. An axial fan having a fan wheel with settable blades, comprising in combination:

(a) a hub having a central hub portion mounted on a fan-wheel driving shaft, a hub rim, and hub rim mounting means extending substantially radially outwardly from said hub portion to the hub rim for rigidly interconnecting said hub portion and said hub rim,

(b) blade attachment shafts having inner ends rigidly mounted to the hub rim and outer ends extending radially outwardly from said hub rim,

(c) fan blades having ends connected to an outer end of a respective blade attachment shaft via bearings for journalling said blades for rotation about the associated blade attachment shaft,

(d) sealed blade bearing housings rigidly connected to the root end of a respective fan blade and surrounding the outer end of the associated blade attachment shaft,

(e) blade setting arms rigidly connected to and projecting from respective blade bearing housings substantially radially relative to a blade setting axis, said arms having a sealed bearing housing formed in outer ends thereof,

(f) a blade setting device which is common to all fan blades and which is axially displaceable and coaxially rotatable relative to the fan wheel,

(g) movement transmission arms having radially inner ends rigidly connected to the setting device and radially outer ends journalled in the sealed bearing housing in the outer end of a respective blade setting arm for both substantially radial movement relative to the fan wheel and universal movement, and

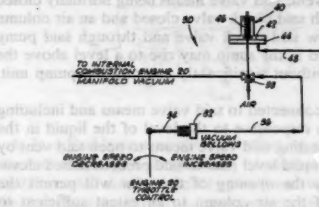
(h) chambers formed in said blade attachment shafts and extending radially inwardly of the associated blade bearing housing and setting arm bearing housing, said chambers being arranged to contain a suitable substance, such as lubricating or protecting agent, and communicating with said associated bearing housings in a manner such that the substance is pressed into said bearing housings by centrifugal force during operation of the fan.

4,215,974

PUMPING RATE CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE DRIVEN PUMPS

Steven M. Cantrell, 2216 E. 18th St., Ada, Okla. 74820, and Sydney J. Keasler, 16214 Sinapore, Houston, Tex. 77040

Continuation of Ser. No. 780,036, Mar. 22, 1977, Pat. No. 4,139,332. This application Jan. 26, 1979, Ser. No. 6,898
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.[3] F04B 49/00
U.S. Cl. 417—34 **6 Claims**



1. A method of controlling a fluid pumping rate of an internal combustion engine driven pumping means in fluid communication with a zone of fluid under pressure so that a substantially constant pressure of fluid is maintained in said zone, said method comprising the steps of:

sensing changes in the pressure of said fluid in said zone;

producing a vacuum from a manifold of said internal combustion engine which varies in proportion to said sensed changes in the pressure of said fluid in said zone; and

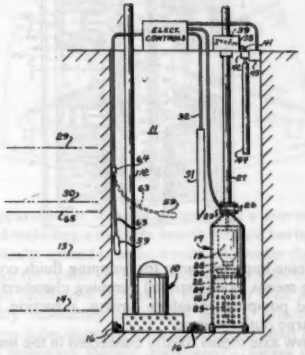
changing a speed of said internal combustion engine and the fluid pumping rate of said pumping means in proportion to changes in the level of said vacuum.

4,215,975

SUMP PUMP WITH AIR COLUMN THEREIN WHEN PUMP IS NOT OPERATING

Karl O. Niedermeyer, 17W068 North St., Bensenville, Ill. 60106

Filed Dec. 13, 1978, Ser. No. 969,065
Int. Cl.[2] F04B 49/06, 49/00
U.S. Cl. 417—53 **5 Claims**



1. An attachment for a sump pump apparatus, or the like, used in a liquid containing sump and comprising a pump unit having a liquid passageway therethrough through which liquid is pumped, said pump unit including a pump and a motor therefor, a liquid discharge conduit communicating with said passageway and extending upwardly therefrom, a check valve

in said discharge line to permit liquid to flow in said line away from said pump unit and to prevent return flow from the line through the passageway, and an electrical control device for energizing the pump unit when the liquid level in the sump rises to a predetermined elevation which is above that of said pump and deenergizing the pump unit when the liquid level thereafter drops to a given elevation, said attachment comprising:

vent means communicating with said passageway below said check valve and above said pump for providing a vent through which fluid can flow from said passageway to a location exterior thereof;

valve means connected to said vent means for opening and closing said vent, said valve means being normally closed whereby with said check valve closed and an air column existing below said check valve and through said pump unit the liquid in the sump may rise to a level above the pump unit without significantly entering the pump unit; and

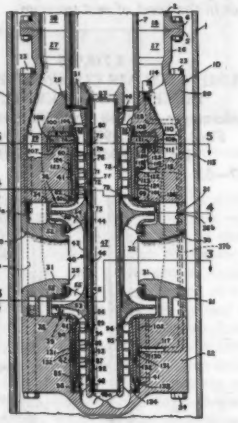
control means connected to said valve means and including sensor means responsive to the level of the liquid in the sump for operating said valve means to open said vent by the time the liquid level rises to said predetermined elevation whereby the opening of the vent will permit the dissipation of the air column to an extent sufficient to allow the liquid level in the pump unit to equilibrate with that of the level elsewhere in the sump thus priming the pump.

4,215,976

TURBINE-IMPELLER PUMP FOR USE IN GEOTHERMAL ENERGY RECOVERY SYSTEMS

Borys Neumann, Convent Station, N.J., assignor to Worthington Pump, Inc., Mountainside, N.J.

Filed May 10, 1978, Ser. No. 904,558
Int. Cl.[3] F01D *3/02*; F04B *17/00, 35/00*
U.S. Cl. 417—409 **15 Claims**



1. A turbine-impeller pump for pumping fluids comprising:

a. casing means having spaced pumping chambers and each of said pumping chambers having, a suction inlet, and discharge outlet means,

b. a hollow axle means fixedly connected in the longitudinal axis of the casing and defining end to end therethrough a motive fluid passage,

c. rotor means mounted for free rotation about said axle means includes, spaced composite impellers thereon in assembled position of the rotor to lie respectively in said spaced pumping chambers for pumping fluid therethrough to the respective discharge outlet means,

d. said rotor means also having a first multi-stage axial flow driving assembly on one side of the spaced composite impellers and a second multi-stage axial flow driving assembly on the opposite side of the spaced composite impellers,

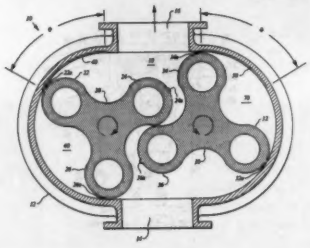
e. means for delivering motive fluid to said casing and to pass one portion of said motive fluid to the inlet end of the first driving assembly and another portion of said motive fluid through the motive fluid passage in the axle means to the inlet end of the second driving assembly whereby the rotor means will be hydraulically balanced during the operation of the turbine-impeller pump.

4,215,977

PULSE-FREE BLOWER

Roger C. Weatherston, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,077
Int. Cl.[3] F04C *17/04, 29/08*
U.S. Cl. 418—1 **19 Claims**



1. A method for providing an essentially pulse free discharge flow as perceived at the outlet of a Root's type blower having two impellers each of which having at least three lobes and including the steps of:

running the impellers at an essentially constant speed;

alternately communicating discharge pressure at an essentially constant, predetermined rate to a trapped well volume defined by adjacent lobes of one impeller and the housing prior to exposure to the outlet followed by similarly communicating discharge pressure to a trapped well volume of the other impeller; and

providing an essentially constant and continuous feed back flow as perceived at the outlet whereby at least one of the trapped well volumes is being filled at all times and brought up to essentially outlet pressure prior to its direct communication with said outlet.

4,215,978

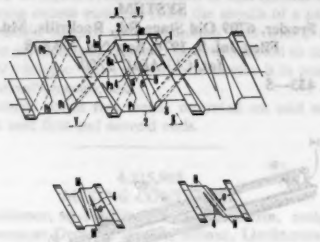
RESIN MOULDING SCREWS

Seizo Takayama, and Kiyoshi Hashimoto, both of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Jul. 14, 1978, Ser. No. 924,657
Int. Cl.[2] B29F *3/02*
U.S. Cl. 425—190 **2 Claims**

1. A screw provided with one helical flight and one valley along the flight and utilized in cooperation with a cylindrical barrel at high temperatures for molding a resinous material, the screw being rotated to advance the helical flight while working the resinous material initially in the form of a solid bed into a melt, the bottom surface of the valley being divided into a plurality of portions along a dividing line extending along said screw flight, said divided portions of the bottom surface being alternately displaced in the radial direction along said screw flight to form wavy contours, the improvement wherein a plurality of barriers each crossing said dividing line are provided to form a dam between one hill and the opposite hill at the bottom of the screw for preventing intercommunication of

the valleys of said divided portions, each barrier having one edge line extending from the one hill and terminating in the hillside of the opposite hill to form one cross point, and the other edge line extending from said opposite hill and terminating in the hillside of said one hill to form the other cross point, said barriers being inclined at an angle with respect to said screw flight such that one of the angularly adjacent dams and the other lie in mutually intersecting directions.

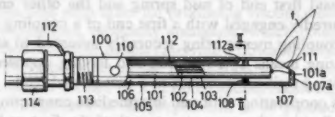


4,215,979

IGNITION TORCH

Teru Morishita, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 11, 1978, Ser. No. 923,587
Claims priority, application Japan, Mar. 1, 1978, 53-23801
Int. Cl.² F02C 7/26
U.S. Cl. 431—264 **4 Claims**



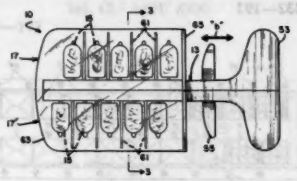
1. An ignition torch comprising:
an elongated cylindrical body closed at one end and having an opening at its other end;
an electrode assembly in said cylindrical body, said assembly comprising:
a cylindrical ground electrode coaxial with the body, the exterior surface of said ground electrode and the interior surface of the body defining an annular duct therebetween;
a linear central electrode extending along the longitudianl axis of the body within said ground electrode and terminating in a spark ignition tip adjacent said opening; and
an insulator between said electrodes;
a through hole defined in said body through which air is fed into said duct, said hole being remote from said opening;
a fuel and air mixing partition wall extending across said air duct adjacent said opening with the ignition tip being between the wall and the opening, said wall having a central circular opening therein through which the electrode assembly extends, a plurality of air holes therethrough arranged in an array around said electrode assembly, and an imperforate blind portion; and
a fuel feed pipe in said annular duct, said pipe terminating in an open injection outlet end spaced a short distance from and facing said blind portion of the wall on the side thereof remote from the tip, said fuel feed pipe extending into said body through the closed end thereof.

4,215,980

PERCUSSIVELY-IGNITABLE FLASHLAMP ASSEMBLY AND SELECTIVE FIRING MECHANISM THEREFOR

John P. Ramsay, Hillsboro, N.H., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jun. 30, 1978, Ser. No. 921,024
Int. Cl.² F21K 5/02
U.S. Cl. 431—359 **12 Claims**



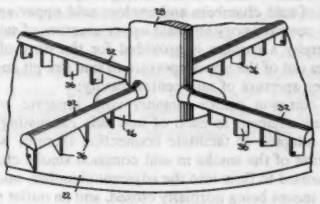
1. In a flashlamp assembly including an elongated support member defining a longitudinal channel therein, a spring-loaded ratchet member slidably positioned within said longitudinal channel, a plurality of percussively-ignitable flashlamps mounted on said support member, and a movable carriage member including a resilient striking mechanism positioned thereon in engageable contact with said ratchet member and projecting from said carriage member for selectively firing said flashlamps in response to movement of said ratchet and carriage members, respectively, the improvement wherein said ratchet member defines a longitudinal passage therein, said carriage member movably oriented within said longitudinal passage.

4,215,981

HEATING OR COMBUSTION APPARATUS AND METHOD

Charles F. von Dreusche, Jr., Ramsey, N.J., assignor to Nichols Engineering & Research Corp., Belle Mead, N.J.

Filed Oct. 12, 1978, Ser. No. 950,729
Int. Cl.² F27B 9/16
U.S. Cl. 432—139 **5 Claims**

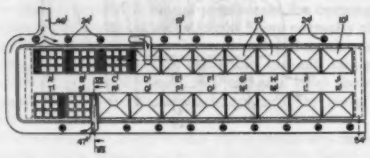


1. In apparatus for treating materials in a corrosive atmosphere and including a multiple hearth furnace having a plurality of vertically spaced hearths, a rotatable center shaft extending through the center of the furnace and through each hearth, at least one rabble arm secured to the center shaft and extending radially outwardly over each hearth, adjacent hearths having drop holes disposed toward the center shaft and toward the outer periphery thereof, respectively, means for heating each hearth, and means for introducing material to be treated into an upper hearth; the improvement which comprises rabble teeth formed of a glass-ceramic material having a modulus of elasticity of about 9.3×10^6 psi and a Knoop hardness of about 250 and capable of withstanding temperatures of the order of 1800° F., said teeth depending from said rabble arms toward the surface of their respective hearth.

4,215,982
CONTINUOUS RING FURNACES FOR BAKING AND REBAKING CARBON ARTICLES

Jean L. Génevois, Milan; Renato Piva, Ascoli Piceno, and Antonio Lucia, Terni, all of Italy, assignors to Elettrocarbonium S.p.A., Milan, Italy

Filed Apr. 28, 1977, Ser. No. 791,692
Claims priority, application Italy, May 5, 1976, 49336 A/76
Int. Cl.[2] F27B *13/00*
U.S. Cl. 432—192 2 Claims



1. In a continuous-ring furnace comprising a plurality of sequentially arranged and communicating chambers where, in the operational mode, each of said chambers being utilized is covered by a movable chamber crown and at least one chamber first in said sequential arrangement is being cooled, at least one chamber intermediary in said sequential arrangement is being heated and at least one chamber last in said sequential arrangement is being pre-heated and wherein hot gases are sequentially caused to flow therethrough;

(a) each of said chambers comprising (1) a central cavity, provided with an upper aperture and containing a plurality of muffles spaced apart to form a plurality of vertical passageways therebetween, said vertical passageways provided with a lower aperture communicating with a lower cavity, said lower cavity formed beneath said central cavity and provided with a side exhausting passage which is normally closed, and (2) a fire pit provided with (i) at least one upper aperture adjacent to and upstream of said upper aperture of said central cavity, said upper aperture of said fire pit of said first chamber in said sequential arrangement being closed, (ii) at least one vertical passage provided with means for heating gases passed therethrough and (iii) a lower aperture connected to and communicating with the lower cavity of the adjacent chamber upstream in said sequential arrangement;

(b) each said chamber crowns being adapted to seat over any one of said chambers and enclose said upper aperture of said central cavity and said upper aperture of said fire pit, whereby a passage is provided for the flow of said hot gases out of the upper aperture of said fire pit and into the upper aperture of said central cavity;

(c) a common smoke channel with separate connection means adjacent to each of said side exhausting passages and adapted to facilitate connection thereto, whereby a portion of the smoke in said common smoke channel can be caused to flow into the adjacent chamber, said connection means being normally closed, and an outlet means for expulsion of smoke from said furnace; and

(d) a movable hood, communicating at one end with the aperture of the fire pit adjacent to the last of said chambers in said sequential arrangement, communicating at the other end with the corresponding connection means of said common smoke channel which is open, and adapted to be moved to communicate with any of said chambers and said common smoke channel;

the improvement comprising a movable bridge member connecting an open connection means of said common smoke channel with the adjacent open side exhausting passage of the first chamber in said sequential arrangement, and mounted for movement from one to any other of said chambers, whereby in operation said movable bridge member facilitates the flow of a portion of the smoke from said common smoke channel through said adjacent side exhausting passage and lower cavity and into said first chamber to be recycled through said furnace.

4,215,983
ORTHODONTIC HEADGEAR APPLIANCE SAFETY SYSTEM

Paul D. Frazier, 6709 Old Stage Rd., Rockville, Md. 20852

Filed Jul. 9, 1976, Ser. No. 703,828
Int. Cl.[2] A61C *3/00*
U.S. Cl. 433—5 9 Claims

1. A safety orthodontic headgear tensioning system for use with an orthodontic facebow, comprising:

a coil spring having a first end and a second end for producing the tensioning forces of the system;

a tube having a first opening at one end and a second opening at the other end for enclosing said coil spring and intermediate connecting means, said first end located near said first opening and said second end located near said second opening, said tube having opposed elongated cutouts oriented longitudinally to the tube near the first end thereof;

said connecting means comprising a rigid member with a plurality of holes along at least an intermediate portion thereof, one end of said member being securedly engaged to said first end of said spring and the other end being securedly engaged with a first end of a coupling means;

said coupling means being securedly mounted to said connecting means at a first end and having opposed travel limiting resilient members at a second end; and

means cooperating with said intermediate connecting means for limiting the expansion travel of the first end of said spring with respect to said first tube opening.

4,215,984
DENTAL SUCTION DEVICE

Joseph P. Reichley, 20 Davis Ave., Enon, Ohio 45323

Filed Jan. 15, 1979, Ser. No. 3,230
Int. Cl.[2] A61C *17/04*
U.S. Cl. 433—93 7 Claims

1. A dental suction device comprising:

an elongated tubular stem;

connection means at a first end of said stem for connection with a suction line;

a generally U-shaped, tubular base member adapted to fit in a patient's lower jaw area inside the lower row of teeth and having a short, curved, tubular member in fluid connection with said base member at about the midpoint of

said base member and extending rearwardly therefrom; whereby a clear area is left for a dentist to insert, position, and seat an impression tray,

joint at a second end of said stem for connection with said curved tubular member;

a plurality of liquid evacuation slots in said tubular base for removing excess moisture from the mouth of a patient;

an elliptically shaped plate spanning said short, curved, tubular member and attached thereto adapted to depress a patient's tongue when said suction device is in position in the patient's mouth; and

an adjustable tooth rest means mounted on said stem between said first and second ends.

4,215,985

MIXING CONTAINER

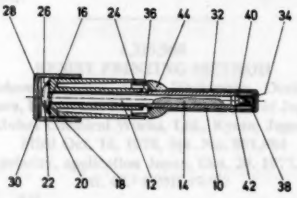
Bruno Madlener, A-Feldkirch-Tosters, Austria, assignor to Establissement Dentaire Ivoclar, Schaan, Liechtenstein

Filed Sep. 13, 1978, Ser. No. 941,866

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741184

Int. Cl.[2] A61C *5/04*

U.S. Cl. 433—90 **17 Claims**



1. A container construction for receiving substances adapted to combine with each other for producing viscous medical and dental preparations, especially amalgams, which comprises in combination: chamber means receiving a flowable substance to form a first component of the preparation to be produced, a mixing chamber formed by a flexible member receiving at least a second component of the preparation to be produced, said chamber means being positioned to convey flowable substance therein to said mixing chamber, means for bringing about intermixing with the content of the latter, said mixing chamber having a discharge end and at least within the region of said discharge end comprising a flexible discharge tubular section projecting therefrom as well as bendable angularly for application of the preparation mixed in the container for distribution into differing dental-medical locations and a rigid protective sleeve surrounding said flexible discharge tubular section and being detachable relative thereto.

4,215,986

ARRANGEMENT FOR THE SHOCK-ABSORBENT MOUNTING AND SUPPORT OF A DENTAL SUPERSTRUCTURE

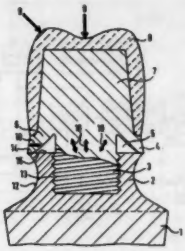
Guido Riess, Marienplatz 7, 8100 Garmisch-Partenkirchen, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,294

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2830025

Int. Cl.[2] A61C *8/00*

U.S. Cl. 433—173 **2 Claims**



1. In an arrangement for the shock-absorbent mounting and support of a dental superstructure, such as a tooth crown, a fastening element for dental bridges and the like, on an artificial tooth having an implantable root and an intermediate member of a tissue-compatible material facilitating a sealing contact with the gingiva, the improvement comprising: a mounting member for said dental superstructure having a central externally threaded projection; said intermediate member including an internally threaded bore engageable with said central externally threaded projection to form a detachable threaded connection interconnecting said intermediate member with said mounting member; and said intermediate member including a rockable support encompassing said threaded connection so as to form a hollow space thereabout, said rockable support extending into a lip sealingly engaged along on outer edge on an upper surface of said intermediate member, and said rockable support further being substantially triangularly shaped in cross-section and said hollow space being generally triangular in cross-section whereby, when said mounting member is fastened onto said intermediate member, said hollow space has a first side thereof bordered by the threaded projection, the second side by said rockable support, and the third side thereof by the upper surface of said intermediate member.

4,215,987
PROCESS FOR CHEMICALLY IMPARTING A DURABLE, MULTIPLE-LEVEL, PILE HEIGHT TO TERRY TOWELLING, TERRY FABRIC AND CUT PILE COTTON FABRIC

K. Karl Mueller, Armonk, N.Y., and Christopher J. Lupton, Lubbock, Tex., assignors to Cotton Incorporated, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,258
Int. Cl.² D06P 5/00
U.S. Cl. 8—115 **12 Claims**

1. A process for imparting a durable, multiple-level, pile height to bleached, unbleached or dyed material selected from the group consisting of terry towelling, terry fabric and cut pile cotton fabric, said material having a ground layer supporting a surface layer of piles on at least one of its faces, said process comprising:

(a) applying a caustic paste to at least one predetermined area of one of the surface layers of piles;

(b) allowing the caustic paste sufficient time to shrink the piles in said at least one predetermined area in the absence of substantial shrinkage of the ground layer; and

(c) recovering the material,

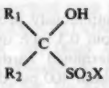
said process further being characterized in that the paste viscosity, the manner of applying the paste, and the time are selected effectively to shrink the piles without contacting said ground layer.

4,215,988
RESIST PRINTING METHOD

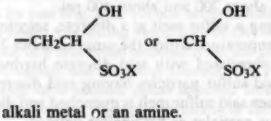
Kazuo Kohama, Kyoto; Akira Hashimoto, Osaka; Junichi Nakamura, Kyoto, and Kazuo Tao, Shiga, all of Japan, assignors to Meisei Chemical Works, Ltd., Kyoto, Japan

Filed Oct. 16, 1978, Ser. No. 951,884
Claims priority, application Japan, Oct. 20, 1977, 52-127119
Int. Cl.² C09B 49/00
U.S. Cl. 8—448 **10 Claims**

1. A method for preventing development or fixation of a vinyl sulfone type reactive dyestuff in a fibrous material characterized in using a resist printing paste which comprises at least one compound having the following general formula:



wherein R_1 is hydrogen, an alkyl group or an aryl group, R_2 is an alkyl group, an aryl group,



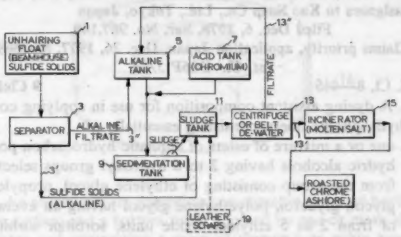
and X is an alkali metal or an amine.

4,215,989
PROCESS FOR CHROME RECOVERY FROM INDUSTRIAL WASTE AND THE LIKE, AS FROM CHROME-LADENED TANNERY WASTE, INCLUDING POLLUTION CONTROL OF THE SAME

James E. Cartier, Saco, Me., assignor to Saco Tanning Division of Kirstein Leather Co., Saco, Me.

Filed Jun. 19, 1978, Ser. No. 916,464
Int. Cl.² C14C 3/06
U.S. Cl. 8—94.27 **13 Claims**

1. A process for reducing BOD loading in tannery primary treatment, while increasing the efficiency of chrome recovery therefrom and enabling substantial chrome reclamation and re-use, said process comprising, alkaline-treating skins and the like to unhair the same; separating out a filtrate and a substantial portion of the resulting alkaline solids; applying the filtrate to an alkaline equalization tank, mixing the same with trivalent chrome acid and feeding the mix to a sedimentation tank with substantially reduced alkaline solids and associated BOD loading; removing the resulting sludge from the sedimentation tank and applying thereto the said alkaline solids sufficiently to raise the pH to at least 11.5 to 12 so as to provide conditions required, upon incineration, efficiently to oxidize the trivalent chrome to the hexavalent state; dewatering the sludge; incinerating the resulting solids in the presence of hot air and carbonate to recover chrome ash in the hexavalent state; increasing the efficiency of such hexavalent chrome recovery by backw-



etting the ash and roasting the same to improve the hexavalent conversion; and utilizing such of the ash as it is desired to reclaim for the tannery treatment operation by adding the same to a sulfuric acid-water solution to form an acid ash slurry; adding a reducing agent to the slurry to convert the hexavalent chromium to the trivalent state; filtering out an extract solution, water-washing the filtering, and recovering the residue; applying the waterwash to use as one of waste treatment processing as a flocculating agent, a component of a pickling agent, and a re-cycled solution; and utilizing the extract solution for one of pre-tanning and production of a chrome tanning liquor.

4,215,990
PEROXYGEN BLEACHING AND LAUNDERING COMPOSITIONS

John H. Barrett, Jr., La Mirada, and Elizabeth F. Formeloza, Wilmington, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Filed Apr. 14, 1978, Ser. No. 896,382
Int. Cl.² D06L 3/00
U.S. Cl. 8—107 **16 Claims**

1. A method for preventing caking and promoting flowability of a granular peroxygen bleaching and laundering composition which comprises adding to said composition corn starch, diethyl phthalate or mixtures thereof in an amount sufficient to reduce caking and promote flowability of said composition.

4,215,991
PROCESS FOR PRODUCING CLOQUÉ OR UNDULATING EFFECTS ON THE SURFACES OF TEXTILE FABRICS

Alfred Steiger, Wattwil, Switzerland, assignor to Heberlein Textildruck AG, Wattwil, Switzerland

Filed Mar. 1, 1979, Ser. No. 16,383
Claims priority, application Switzerland, Mar. 3, 1978, 2322/78
Int. Cl.² D06Q 1/02
U.S. Cl. 8—115 **7 Claims**

1. Process for producing cloqué or undulating patterns on the surfaces of textile fabric made from synthetic fibres, comprising subjecting the fabric to a first heat-treatment at temperatures between 100° C. and 200° C. with tension and/or pressure being applied for temporarily increasing the density of the

fibres in the fabric, applying a resist paste capable of withstanding high temperatures to the specifications of a pattern, subjecting the fabric to a second heat-treatment at temperatures ranging between 100° C. and 200° C. to decrease the density of the threads in those areas not printed with resist paste, and washing and drying the fabric.

4,215,992

DYEING ASSISTANT FOR PRINTING

Toshio Sato, and Shigeru Nagao, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1978, Ser. No. 967,140
Claims priority, application Japan, Dec. 26, 1977, 52-156949
Int. Cl.³ D06P 5/04
U.S. Cl. 8—445 **9 Claims**

1. A dyeing assistant composition for use in applying color on hydrophobic fibers, consisting essentially of

I. one or a mixture of esters of aliphatic hydrocarbon polyhydric alcohols having 2 to 8 hydroxyl groups selected from the group consisting of ethylene glycol, propylene glycol, glycerol, polyethylene glycol having an average of from 2 to 5 ethylene oxide units, sorbitan sorbitol, pentaerythritol, trimethylolethane and trimethylolpropane, with fatty acids having 6 to 22 carbon atoms, or ethylene oxide adducts of said esters, and

II. one or a mixture of ethylene oxide adducts of aliphatic monoamines or diamines having 8 to 40 carbon atoms, or quaternary ammonium salts of said adducts,

wherein the weight ratio of I:II is in the range of from 1:1 to 100:1.

4,215,993

PRECIPITATING REAGENT AND METHOD FOR ISOLATION AND DETERMINATION OF HIGH DENSITY LIPOPROTEINS IN HUMAN SERUM

James L. Sanders, Arlington, Tex., assignor to Data Medical Associates, Inc., Arlington, Tex.

Filed Dec. 4, 1978, Ser. No. 966,145
Int. Cl.² G01N 33/16
U.S. Cl. 23—230 B **24 Claims**

1. A precipitating reagent for selectively precipitating low density lipoproteins from human serum which comprises phosphotungstic acid, an organic buffer having a pH buffering range of from about 4.8–6.8 and a concentration of from about 0.2 molar to about 1.2 molar and a neutral polymer selected from the group consisting of polyvinylpyrollidone, polyethylene glycol and poly-N-vinyl-5-methyl-2-oxazolidinone, said phosphotungstic acid and said neutral polymer present in effective amounts for selectively precipitating low density lipoproteins.

4,215,994

PROCESS FOR LIQUID-LIQUID SORBENT EXTRACTION

Rudolph Kodras, 412 S. Robinson St., Baltimore, Md. 21224

Filed Sep. 23, 1974, Ser. No. 508,642
Int. Cl.² G01M 31/00
U.S. Cl. 23—230 B **4 Claims**

1. A process for the extraction of a desired substance(s) in which a sorbent wetted with one of two immiscible liquids exchanges the first liquid (nonpolar) for the second liquid (polar) and whereupon the first liquid extracts the desired substance(s) from the second liquid.

4,215,995

TEST MEANS AND ASSAY FOR DETERMINING THE UREA CONTENT OF FLUIDS

Richard S. Turk, Elkhart, and Adam P. Zipp, Goshen, both of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 915,587, Jun. 15, 1978, abandoned. This application May 15, 1979, Ser. No. 39,113
Int. Cl.² G01N 31/22, 33/16
U.S. Cl. 23—230 R **12 Claims**

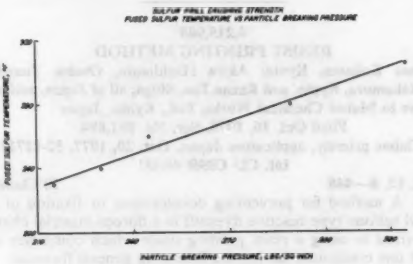
1. Test means for detecting urea which comprises a strong cation exchange resin loaded carrier matrix which is in its acid form having incorporated therewith in separated relation the reagent o-phthalaldehyde and a reagent from the group consisting of 3-hydroxy-1,2,3,4-tetrahydrobenzo[h] quinoline, 3-acetoxy-1,2,3,4-tetrahydrobenzo[h]quinoline and their dihydrochloride salts.

4,215,996

CONTROLLING SULFUR PARTICLE HARDNESS

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 627,660, Oct. 31, 1975, Pat. No. 4,087,498. This application Nov. 21, 1975, Ser. No. 634,250
Int. Cl.² B01D 9/00
U.S. Cl. 23—300 **5 Claims**


SULFUR PRILL CRUSHING STRENGTH
FUSED SULFUR TEMPERATURE VS PARTICLE BREAKING PRESSURE
FUSED SULFUR TEMPERATURE, °F
PARTICLE BREAKING PRESSURE, LBS/SQ INCH

1. The method of continuously producing sulfur particles having diameters of about 0.5 inch or less and having a selected, discrete, predetermined hardness value within the range of about 200 to about 400 psi. determined by the ideal cylindrical particle model throughout a continuous sulfur particle production run period, which method includes the steps of;

(a) selecting said discrete, predetermined hardness value between about 200 and about 400 psi.;

(b) producing a sulfur melt at a discrete, selected, predetermined temperature within the range of about 238° to about 340° F. correlated with said discrete hardness value to obtain said sulfur particles having said discrete hardness value when said sulfur melt is quenched and dispersed into said sulfur particles as hereinafter defined;

(c) crystallizing the thus formed sulfur melt in an agitated liquid phase quench medium at a temperature below 200° F., which quench medium is selected from the group consisting of organic and inorganic liquids having melting points below the temperature of said quench medium and in which crystalline rhombic sulfur is soluble at 200° F. in amounts of less than about 0.1 weight percent and with which said sulfur is unreactive at said quench medium temperature, and combinations thereof, through a quenching temperature gradient defined as the differential between the respective temperatures of said quench medium and the said sulfur melt of at least about 100° F., with agitation of said quench mediums sufficient to disperse said sulfur melt into particles having diameters of less than about 0.5 inch prior to crystallization thereof;

(d) consistently maintaining said sulfur melt temperature at

said discrete, predetermined value throughout said continuous production run period, and

(e) consistently maintaining said quenching temperature gradient at a level of at least about 100° F. throughout said continuous production run period to consistently produce said sulfur particles having said discrete, predetermined hardness value.

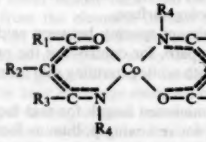
4,215,997

FUEL COMPOSITIONS CONTAINING TETRACOORDINATED COBALT COMPOUNDS

Charles A. Sandy, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 10, 1979, Ser. No. 56,217
Int. Cl.² C10L 1/30
U.S. Cl. 44—68 **10 Claims**

1. A hydrocarbon fuel composition comprising liquid hydrocarbons boiling in the range of about 20° C. to 400° C., and an amount to provide about 0.02 to 5 grams of cobalt metal per gallon of said hydrocarbon fuel composition of at least one divalent tetracoordinated cobalt compound represented by the structure



wherein:

R_1, R_2 and R_3 are independently selected from hydrogen and C_{1-6} alkyl, and

R_4 is a branched C_{3-6} alkyl wherein the branching is on either or both of the number 1 and 2 carbon atoms of said alkyl group.

4,215,998

CATALYST AND PROCESS FOR PRODUCTION OF METHANE-CONTAINING GASES

Hideo Futami, No. 3306-631, Isogo Apartment, 3, 3-chome, Shiomidai, Isogo-ku, Yokohama-shi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 829,489, Aug. 31, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,218
Int. Cl.² C07C 3/34; B01J 21/04
U.S. Cl. 48—214 A **13 Claims**

1. A catalyst material for use in production of methane-containing gases by reacting 2–12 carbon atom containing hydrocarbons with steam, consisting essentially of (A) 60 to 90% by weight of oxide of a first metal selected from the group consisting of nickel, cobalt and mixtures thereof, (B) 2 to 15% by weight of oxide of a second metal selected from the group consisting of lanthanum, cerium and mixtures thereof and (C) 5 to 30% by weight of aluminum oxide, said catalyst material being prepared by a process comprising:

adding an aqueous solution of an alkaline substance to an aqueous solution of aluminum salt to form a first stage precipitate containing aluminum;

adding an aqueous solution of the alkaline substance to a mixture of an aqueous solution of a second metal salt and said first stage precipitate to form a second stage precipitate containing second metal on said first stage precipitate;

adding an aqueous solution of the alkaline substance to a mixture of an aqueous solution of a said first metal salt and said second stage precipitate to form a third stage precipitate containing first metal on the second stage precipitate;

recovering the precipitate product resulting from said three stage operation; and

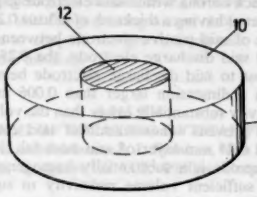
converting said first and second metals and aluminum in said product to their oxides.

4,215,999

ABRASIVE COMPACT WITH A CORE OF HIGH RIGIDITY MATERIAL

Cornelius Phaal, 14 Robant La., Sandton, Transvaal, South Africa

Filed Feb. 28, 1978, Ser. No. 882,812
Claims priority, application South Africa, Mar. 3, 1977, 77/1274
Int. Cl.² B24D 3/06
U.S. Cl. 51—295 **14 Claims**



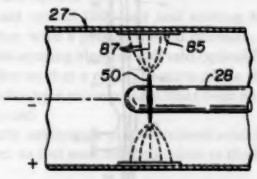
1. An abrasive body comprising an abrasive compact having a top surface and a bottom surface joined by one or more side surfaces and comprising a mass of diamond or cubic boron nitride abrasive particles, present in an amount of at least 70 percent by volume of the compact, bonded into a hard conglomerate; and a core of high rigidity material selected from the group consisting of steel and cemented metal carbides embedded in the compact and being located inside the side surface or surfaces and extending from the top surface to the bottom surface of the compact.

4,216,000

RESISTIVE ANODE FOR CORONA DISCHARGE DEVICES

Melvin J. Kofoid, Seattle, Wash., assignor to Air Pollution Systems, Inc., Kent, Wash.

Continuation-in-part of Ser. No. 784,196, Apr. 18, 1977, abandoned. This application Nov. 15, 1978, Ser. No. 960,923
Int. Cl.² B03C 3/12
U.S. Cl. 55—138 **46 Claims**



1. In an apparatus having a discharge electrode, a passive electrode spaced apart from said discharge electrode by an electrode gap, power supply means connected between said discharge and passive electrodes for applying a voltage therebetween, said applied voltage being of sufficient magnitude to effect a corona current producing electrostatic field between said discharge and passive electrodes, means for preventing sparkover and suppressing back corona within said electrode gap comprising a layer of material on said passive electrode between said discharge electrode and said passive electrode means having a thickness of at least 0.25 mm, the 0.25 mm of said material closest to said discharge electrode being devoid of volumes with a dimension larger than 0.006 mm having a volume resistivity substantially lower than the volume resistivity needed to prevent concentration of said corona current such that said 0.25 mm of material closest to said discharge electrode is a substantially homogeneous primary layer having

sufficient volume resistivity to suppress back corona and prevent sparkover.

21. In a high intensity ionizer having a tubular passive electrode adapted to conduct particulate-laden gas therethrough, a planar discharge electrode concentrically mounted within said passive electrode and separated therefrom by an electrode gap, power supply means connected between said discharge and passive electrodes for applying a voltage therebetween, said applied voltage being of sufficient magnitude to effect a corona current producing electrostatic field between said discharge and passive electrodes, means for preventing sparkover and suppressing back corona within said electrode gap comprising a layer of material having a thickness of at least 0.25 mm on the inside surface of said passive electrode between said passive electrode and said discharge electrode, the 0.25 mm of said material closest to said discharge electrode being devoid of volumes with a dimension larger than 0.006 mm having a volume resistivity substantially lower than the volume resistivity needed to prevent concentration of said corona current such that said 0.25 mm layer of said material closest to said discharge electrode is a substantially homogeneous primary layer having sufficient volume resistivity to suppress back corona and prevent sparkover.

4,216,001

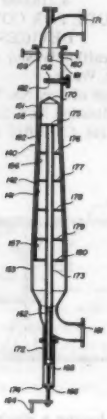
GAS SCRUBBING APPARATUS

Richard J. Brooks, Seattle, and Burton Brooks, Bellevue, both of Wash., assignors to The Chemithon Corporation, Seattle, Wash.

Continuation of Ser. No. 748,908, Dec. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 598,847, Jul. 24, 1975, abandoned, which is a division of Ser. No. 393,192, Aug. 30, 1973, abandoned. This application Jan. 10, 1979, Ser. No. 2,244

Int. Cl.[2] B01D *47/10*

U.S. Cl. 55—240 **8 Claims**



1. An apparatus for the removal of pollutants from effluent gases by a scrubbing operation, said apparatus comprising:

an elongated, vertically disposed duct including at least a pair of separate, discrete, vertically extending, horizontally spaced, facing surfaces comprising means defining therebetween an unobstructed, vertically extending flow path substantially devoid of directional and cross-sectional area change;

the disposition of said facing surfaces along a horizontal cross-section of said flow path being substantially parallel;

the disposition of said facing surfaces along a vertical cross-section of said flow path being substantially parallel;

said duct comprising a vertically disposed upper portion located above said facing surfaces and aligned with and in direct communication with said flow path, said upper duct portion having an open upper end spaced above said facing surfaces;

said unobstructed flow path having relatively little cross-sectional area change along its length, compared to the cross-sectional area change between (a) said upper portion of said duct and (b) the upstream end of said flow path;

means located within said duct for introducing scrubbing liquid into said duct and for providing a descending film of scrubbing liquid on each of said facing surfaces from substantially the top to the bottom of said facing surfaces;

means for introducing a stream of gas into said open upper end of said upper duct portion and for flowing said stream of gas between said facing surfaces downwardly from the top to the bottom thereof with relatively little change in the velocity of said stream of gas as it flows between said facing surfaces, compared to the change in gas velocity between (a) said upper portion of the duct above said facing surfaces, and (b) said upstream end of the flow path defined by said facing surfaces;

means, located below said facing surfaces, for removing gas and scrubbing liquid from said duct;

a pre-selected maximum spacing between said facing surfaces of the flow path, for maintaining said stream of gas in intimate concurrent flow with the film of scrubbing liquid on each facing surface;

a pre-selected mimimum spacing between said facing surfaces of the flow path, for controlling the pressure drop along said flow path while providing said intimate concurrent flow;

and a pre-selected minimum length for said facing surfaces of the flow path, for removing pollutants from said gases to the extent required without also requiring a prohibitive pressure drop along said flow path to accomplish the removal.

4,216,002

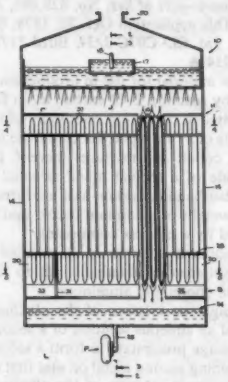
SELECTIVE CONDENSATION PROCESS AND CONDENSER APPARATUS

Axel E. Rosenblad, Highlands, N.J., assignor to Rosenblad Corporation, Princeton, N.J.

Continuation of Ser. No. 737,683, Nov. 1, 1976, abandoned. This application Jan. 11, 1979, Ser. No. 2,685

Int. Cl.[2] B01D *51/00*

U.S. Cl. 55—267 **16 Claims**



1. Apparatus for selective condensation of vapors contaminated by volatile substances to produce a first, relatively clean stream of condensate and a second condensate stream carrying more of contaminants than said first stream, comprising a falling film heat exchanger having a plurality of plate heat exchange elements wherein vapor is condensed by the flow of

liquid down surfaces of the heat exchange elements, each of said heat exchange elements comprising a pair of spaced generally parallel plates sealed together around substantially their entire peripheries, upper header means communicating with all of said heat exchange elements near an upper end of each such heat exchange element for the free passage of vapor among the upper portions of the heat exchange elements, a lower header enclosing all of said heat exchange elements, said lower header having a top wall, a bottom wall, a front wall and a back wall, an inlet and outlets connected to said lower header, and a barrier extending from said top wall to said bottom wall and from said front wall to said back wall of said lower header to separate said lower header into non-communicating compartments, said inlet constituting means for introducing vapor to be condensed into lower portions of one group of said heat exchange elements via an opening through said lower header back wall into the interior of each element of said one group for upward passage of vapor within said one group of heat exchange elements, one outlet connected to said lower header constituting a first condensate outlet for discharging said first condensate stream from the elements of said first group, a second group of heat exchange elements wherein vapor to be condensed passes downward after said upward passage, each element of said second group opening on to said lower header through said lower header back wall on the opposite side of said barrier from the elements of said first group, vent gas outlet means and second condensate outlet means connected to said lower header and spaced away from said first condensate outlet for discharging said second condensate stream and vent gases from the heat exchange elements of said second group, said barrier preventing contact between said first and second condensate stream said first and second condensate outlets being non-communicating.

4,216,003

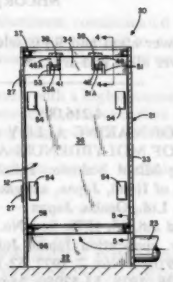
GAS CLEANING SYSTEM

Wolodymyr Diachuk, Minneapolis, Minn., assignor to Century 21 Pollution Control, Inc., Minneapolis, Minn.

Filed Nov. 16, 1978, Ser. No. 961,376

Int. Cl.[2] B01D *46/30*

U.S. Cl. 55—356 **28 Claims**



1. A gas filtering unit comprising: a housing having continuous side walls, an open inlet end, and open outlet end; a plurality of plate means located adjacent the inlet end of the housing and extended across the inlet end thereof, means mounting said plate means on the housing, adjacent said plate means being spaced from each other to provide gas inlet openings, cross bar means secured to the outlet end of the housing and to rail means extending around said outlet end and said cross bar means extends across the outlet end thereof generally parallel to the plate means; a plurality of perforated walls extended between the plate means and cross bar means and secured thereto, said walls forming chambers for accommodating gas filtering means, said chambers having open upper ends; gas filtering means located in said chambers; cover means engageable with the cross bar means for closing the open upper ends of the chambers; and means attaching the cover means to the rail means so as to hold the cover means in engagement with the cross bar means.

13. Gas filtering structure comprising: a gas filtering unit having hanger means to support the unit; a housing having an upper end, a lower end, a chamber for accommodating said gas filtering unit, said housing having gas inlet means and gas outlet means, said gas inlet means and said gas outlet means being in communication with said chamber; means mounted in the housing for supporting the gas filtering unit in the chamber, said means including rail means having at least one horizontal upright flange, said flange having means cooperating with the hanger means to support the gas filtering unit on the means mounted on the housing.

4,216,004

METHOD OF BREAKING OPTICAL FIBERS

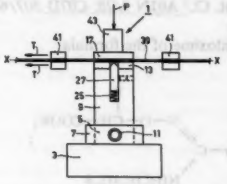
Rudolf Brehm, and Adrianus J. J. Franken, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 844,745, Oct. 25, 1977, abandoned. This application Feb. 5, 1979, Ser. No. 9,881

Claims priority, application Netherlands, Nov. 1, 1976, 7612082

Int. Cl.[2] C03B *37/00*

U.S. Cl. 65—2 **7 Claims**



1. A method of breaking an optical fiber comprising the steps of:

fixing said optical fiber in position on a support;

positioning a scoring element having a straight cutting edge and a longitudinal axis perpendicular to the longitudinal axis of said optical fiber;

pressing said optical fiber and said scoring element against each other with a predetermined pressure;

moving said scoring element and said optical fiber relative to each other so that a rolling motion of the fiber is obtained and producing a score on said fiber over its entire circumference; and

subsequently applying a predetermined axial tensile force to said fiber so that said fiber is broken at the location of said score.

4,216,095

GLASS CONVEYING ROLL AND A METHOD OF FORMING IT

Norman K. Gladieux, Oregon; Carey M. Allen, and Thomas J. Koralewski, both of Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

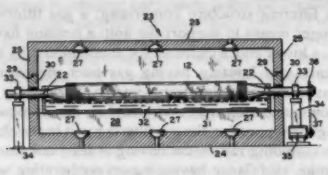
Filed Jan. 4, 1979, Ser. No. 1,023

Int. Cl.[2] C03B *13/16*

U.S. Cl. 65—374 R **12 Claims**

1. In a method of treating a roll including an outer asbestos material-supporting portion for conveying glass at elevated temperatures, the steps of preparing an aqueous solution of potassium sulfate, immersing said outer asbestos portion in said solution for a period of time sufficient to allow said solution to penetrate said asbestos, removing said outer asbestos portion from said solution, and drying said outer asbestos portion whereby potassium sulfate crystallizes within the asbestos.

10. In a roll for conveying glass at elevated temperatures including an asbestos portion upon which the glass is carried,



the improvement wherein said asbestos is impregnated with crystallized potassium sulfate.

4,216,006

HERBICIDAL AND PHYTOHORMONAL AMIDOXIMES

Daniel Farge, Thiais; Jean Leboul, Gif sur Yvette; Yves Le Goff, Bretigny, and Gilbert Poiget, Thiais, all of France, assignors to Philagro, France

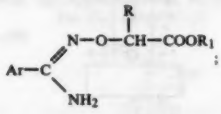
Division of Ser. No. 722,215, Sep. 10, 1976, Pat. No. 4,116,974. This application May 17, 1978, Ser. No. 906,863

Claims priority, application France, Sep. 11, 1975, 75 27884; Jul. 8, 1976, 76 21717

Int. Cl.[2] A01N *9/28*; C07D *307/68*

U.S. Cl. 71—88 9 Claims

1. A new amidoxime of the formula



(I)

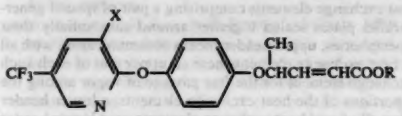
in which

R represents a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, or a phenyl group,

R_1 represents a hydrogen atom or an alkyl group containing 1 to 4 carbon atoms, or a metal atom, and

Ar represents a 5 membered aromatic heterocyclic group which contains an atom of oxygen as the hetero-atom and is optionally substituted by a halogen atom, an alkyl group containing 1–4 carbon atoms, an alkoxy group, an alkylthio group or a phenylalkyl group, wherein the alkyl moiety of each of said groups contains 1 to 4 carbon atoms.

7. A herbicidal composition comprising a herbicidally effective amount of a compound having the general formula (I):



(I)

wherein X is a hydrogen atom or a halogen atom, and R is a (C_1–C_4)alkyl group, as an active ingredient, together with an agriculturally acceptable adjuvants.

4,216,007

4-[4-(5-TRIFLUOROMETHYL-2-PYRIDYLOXY)-PHENOXY]-2-PENTENOIC ACID ESTERS USEFUL AS A HERBICIDE

Ryuzo Nishiyama, Takatsuki; Takahiro Haga, and Nobuyuki Sakashita, both of Kusatsu, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Apr. 27, 1979, Ser. No. 34,039

Claims priority, application Japan, Apr. 27, 1978, 53/49272

Int. Cl.[2] A01N *9/22*; C07D *213/64*

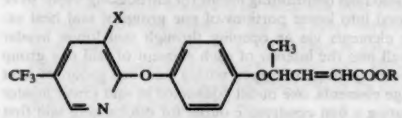
U.S. Cl. 71—094 13 Claims

1. A compound having the general formula (I):

(I)

wherein X is a hydrogen atom or a halogen atom, and R is a (C_1–C_4) alkyl group.

7. A herbicidal composition comprising a herbicidally effective amount of a compound having the general formula (I):



(I)

wherein X is a hydrogen atom or a halogen atom, and R is a (C_1–C_4) alkyl group, as an active ingredient, together with an agriculturally acceptable adjuvants.

4,216,008

BUTENOIC ACID DERIVATIVES

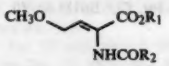
Manfred Weigele, North Caldwell, and Dennis D. Keith, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 653,697, Jan. 30, 1976, abandoned. This application May 22, 1978, Ser. No. 908,043

Int. Cl.[2] C07C *103/85*, *103/49*; A01N *9/24*

U.S. Cl. 71—106 6 Claims

5. A plant growth stimulating composition comprising agriculturally acceptable adjuvants and as the active ingredient, an amount effective in stimulating plant growth of a compound of the formula



wherein R_1 is lower alkyl and R_2 is selected from the group consisting of lower alkyl and aryl.

4,216,009

METHOD OF MAKING ALLOY AND CARBIDE POWDERS OF MOLYBDENUM AND TUNGSTEN

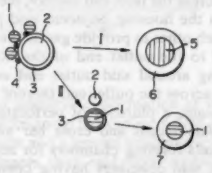
Masaya Miyake; Minoi Nakano; Takaharu Yamamoto, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1978, Ser. No. 927,904

Claims priority, application Japan, Jul. 27, 1977, 52-90618; Jul. 29, 1977, 52-91684; Nov. 2, 1977, 52-131860; Dec. 29, 1977, 52-159300; Apr. 28, 1978, 53-52050; May 17, 1978, 53-59142; May 17, 1978, 53-59143

Int. Cl.[2] C22C *29/00*

U.S. Cl. 75—0.5 AB 20 Claims



1. A process for the production of an alloy powder for

powder metallurgy, said alloy powder consisting essentially of a solid solution of molybdenum and tungsten each in a proportion of from 5 to 95 atomic %, and having a particle size of at most 20 microns, which process comprises mixing molybdenum and tungsten in the form of compounds thereof selected from the group consisting of oxides, hydroxides, chlorides, sulfates, nitrates, metallic acids, salts of metallic acids and mixtures thereof, the resulting mixture of the compounds having a particle size of at most 1 micron, and then reducing the mixture with at least one member selected from the group consisting of hydrogen and ammonia.

4,216,010

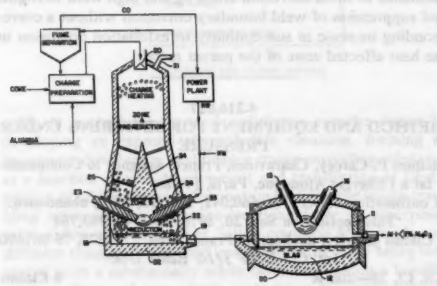
ALUMINUM PURIFICATION SYSTEM

Robert M. Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 881,786, Feb. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 785,676, Apr. 7, 1977, abandoned. This application Jan. 31, 1979, Ser. No. 7,986

Int. Cl.[2] C22D *3/12*

U.S. Cl. 75—68 A **8 Claims**



1. A process for decreasing aluminum carbide contamination of aluminum produced by carbothermic processes, said process comprising:

A. preparing said aluminum contaminated with about 2–20 weight percent aluminum carbide as a melt at an initial temperature sufficiently high to keep said melt in a fluid state;

B. contacting said melt with a high-alumina containing molten slag in the absence of reactive carbon so as to cause the alumina-containing slag to react with the aluminum carbide in said melt; and

C. recovering aluminum having a diminished aluminum carbon content.

4,216,011

METHOD AND APPARATUS FOR THE SECONDARY GASEOUS REDUCTION OF METAL ORES

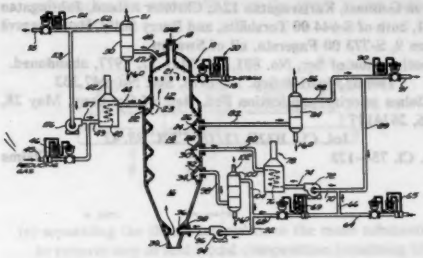
Enrique R. Martinez Vera, Monterrey, and Jorge O. Becerra Novoa, San Pedro Garza Garcia, both of Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Apr. 23, 1979, Ser. No. 32,665

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—91 **18 Claims**

1. A method for reducing a particulate metal ore to metal particles in a vertical shaft, moving bed reactor having a primary reduction zone in the upper portion thereof in which said ore is reduced and carburized by a carbon-containing reducing gas, a cooling zone in the lower portion of said bed for cooling the reduced ore and a secondary reduction zone between said primary reduction zone and said cooling zone which comprises heating a first stream of substantially inert gas to an elevated temperature, feeding the hot first gas stream to said secondary reduction zone near one end thereof, removing from a point near the other end of said secondary reduction zone a second gas stream comprising said inert gas and a reducing gas formed in said secondary reduction zone, cooling said second stream



and recycling said second stream to said secondary reduction zone as said first stream.

4,216,012

PROCESS FOR THE TREATMENT OF INCINERATED SEWAGE SLUDGE ASH

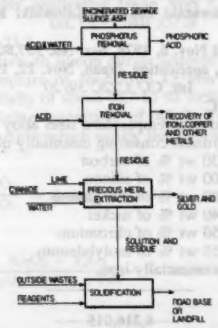
David Krofchak, 160 Torbay Rd., Markham, Ontario, L3R 1G6, Canada

Filed Mar. 23, 1979, Ser. No. 23,224

Claims priority, application United Kingdom, Apr. 4, 1978, 13203/78; Jul. 26, 1978, 31188/78

Int. Cl.[2] C22B *11/08*

U.S. Cl. 75—101 R **16 Claims**



1. A process for the treatment of incinerated sewage sludge ash containing silicic compounds and metal values including phosphorus and at least one precious metal, comprising leaching the ash in an acid solution in a first leach to dissolve phosphorus, separating leach solution from undissolved residue, treating the leach solution to recover a phosphorus-containing product, and treating the undissolved residue to recover at least one precious metal.

4,216,013

DUCTILE FERRITIC STEELS AND THEIR USE FOR METALLIC ARTICLES, ESPECIALLY WELDED CONSTRUCTIONS

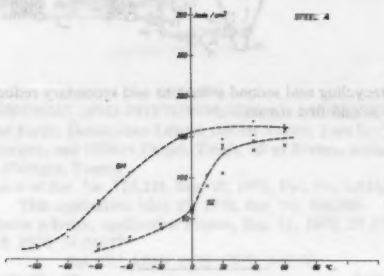
Göran Gemmel, Karlsrogatan 12A; Christer Aslund, Juhlingatan 21, both of S-644 00 Torshälla, and Barry Solly, Regnbaagsvägen 9, S-773 00 Fagersta, all of Sweden

Continuation of Ser. No. 801,374, May 27, 1977, abandoned. This application Sep. 28, 1978, Ser. No. 947,332

Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2624117

Int. Cl.[2] B32B *15/18*; C22C *38/42*

U.S. Cl. 75—125 **2 Claims**



1. Ferritic, stabilized, corrosion-resistant and ductile chromium-molybdenum-nickel steels having a ductile area at the weld seam, consisting essentially of

0.012–0.025% Carbon, 0.02–0.5% Silicon, 0.02–0.5% Manganese,

20.0–22.0% Chromium, 3.2–3.5% Nickel, 3.0–4.5% Molybdenum,

0.2–0.5% Copper,

$0.2+4x(C+N_2)$, but at most 0.7 Titanium and/or

$0.2+8x(C+N_2)$, but at most 1.0% Columbium,

0.005 to 0.015% Nitrogen,

The balance essentially iron.

4,216,014

LOW TEMPERATURE STEEL ALLOY

Kaoru Horiuchi, Toride; Akio Matsui, Chiba; Masahiro Hara, Sakura, and Hiroshi Takahashi, Funabashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Nov. 6, 1978, Ser. No. 957,809

Claims priority, application Japan, Nov. 22, 1977, 52-141018

Int. Cl.[2] C22C *39/20*

U.S. Cl. 75—128 C **1 Claim**

1. An improved low temperature steel alloy having a high toughness and hardness consisting essentially of

from 0.20 to 0.30 wt % of carbon

from 1.20 to 2.00 wt % of silicon

from 0.30 to 0.80 wt % of manganese

from 1.70 to 2.40 wt % of nickel

from 2.50 to 3.50 wt % of chromium

from 0.30 to 0.55 wt % of molybdenum

and the balance essentially iron.

4,216,015

WEAR-RESISTANT IRON-NICKEL-COBALT ALLOYS

Anthony J. Hickl, Kokomo, and Barry H. Rosof, Indianapolis, both of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Filed Apr. 9, 1979, Ser. No. 28,467

Int. Cl.[2] C22C *30/00*

U.S. Cl. 75—134 F **8 Claims**

1. An alloy characterized by high wear resistance and suitable weldability consisting essentially of, in weight percent, at least 8.5 cobalt, up to 35 nickel, the total nickel plus cobalt from 25 to 40, up to 10 molybdenum, up to 10 tungsten, the total molybdenum plus tungsten from 4 to 10, 20 to 33 chromium, 0.60 to 1.7 silicon, 0.9 to 1.5 carbon, up to 1.0 boron, and the balance iron and incidental impurities.

4,216,016

FILLER METAL FOR WELDING ALUMINUM ALLOYS

Miroslav Pirner, Neuhausen am Rheinfall; Heinrich Zoller, Aesch, and Heinz Bichsel, Neuhausen am Rheinfall, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 914,531, Jun. 12, 1978, abandoned. This application Oct. 5, 1978, Ser. No. 948,959

Claims priority, application Switzerland, Jun. 29, 1977, 007983/77

Int. Cl.[2] C22C *21/18*

U.S. Cl. 75—141 **3 Claims**

1. A filler metal for welding aluminum alloys consisting essentially of: zinc from 0.05 to 0.25%; magnesium up to 5.5%; copper from 0.2 to 0.5%; manganese from 0.05 to 2.5%; titanium from 0.1 to 0.25%; chromium from 0.05 to 0.3%; and the balance aluminum, said metal being characterized by improved resistance to stress corrosion cracking and high weld strengths and suppression of weld boundary corrosion without a corresponding increase in susceptibility to exfoliation corrosion in the heat affected zone of the parent metal.

4,216,017

METHOD AND EQUIPMENT FOR SINTERING UNDER PRESSURE

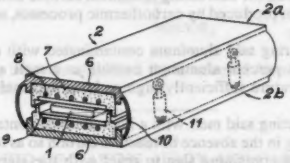
Jacques P. Carcey, Charavines, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 660,041, Feb. 23, 1976, abandoned. This application Sep. 20, 1978, Ser. No. 943,761

Claims priority, application France, Feb. 27, 1975, 75 061690

Int. Cl.[2] B22F *3/16*; B28B *3/00*

U.S. Cl. 75—208 R **6 Claims**



1. A method for sintering under pressure ceramic materials, refractory materials or homogeneous metallic materials, of either uniform or composite structure, wherein said method comprises the following steps:

placing the materials to be sintered in a deformable composite container having substantially opposite top and bottom walls and a lateral wall made up of several elements,

placing said container within a nondeformable treatment module provided with heating means,

pressing said top and bottom walls towards each other until a predetermined temperature is established,

increasing the temperature of said container and the materials therein while pressing said top and bottom walls of said container toward each other at constant pressure while said container is free to expand laterally if necessary by deformation of said container until commencement of sintering of said materials,

simultaneously increasing the temperature of and the pressure applied to press said top and bottom walls until sintering conditions for densification are fully established in said materials,

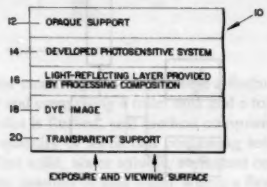
maintaining a constant temperature in said container and a

constant force pressing said top and bottom walls towards each other for a predetermined period of time,
reducing the pressure on said container while maintaining the temperature, and then
reducing the temperature to room temperature.

4,216,018
PHOTOGRAPHIC PRODUCTS AND PROCESSES EMPLOYING LAMELLAR PIGMENTS

Ruth C. Bilofsky, Lexington, and Howard G. Rogers, Weston, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 744,598, Nov. 24, 1976, abandoned. This application Jul. 3, 1978, Ser. No. 921,186
Int. Cl.² G03C *5/54, 1/40, 1/48, 1/84*
U.S. Cl. 430—207 **55 Claims**



39. A method for forming a diffusion transfer image by developing an exposed silver halide emulsion, forming an imagewise distribution of diffusible image-providing substance as a function of said development and transferring at least a portion of said imagewise distribution of diffusible image-providing substances to an image-receiving layer in superposed relationship with said silver halide emulsion to provide said diffusion transfer image, said image-receiving layer being integrated with a substantially white layer comprising a lamellar pigment dispersed in a matrix material so that said diffusion transfer image can be viewed against said substantially white layer said lamellar pigment having at least one layer with a geometric thickness of a value within the expression:

$$T=\lambda/4/n$$

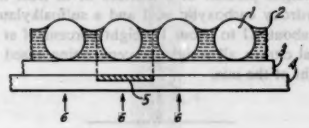
(or an odd multiple thereof)
where T is the geometric thickness of the flake, λ represents a wavelength or wavelength range of radiation in the visible region of the spectrum and n is the refractive index of the lamellar pigment material and is at least 1.7 any layer adjacent said one layer having a geometric thickness of a value also within said expression but comprising a layer material having a refractive index different from the refractive index of said one layer.

4,216,019
PHOTOGRAPHICALLY PRODUCED STENCILS

Kenneth J. Reed, Deer Park Rd., Wimbledon, London SW19, England, and Alan L. Lythgoe, London, England, assignors to Kenneth James Reed, London, England

Filed Jul. 18, 1978, Ser. No. 925,884
Claims priority, application United Kingdom, Jul. 21, 1977, 30750/77
Int. Cl.² G03C *5/00*; B41N *1/24*
U.S. Cl. 430—308 **12 Claims**

1. A method for producing a stencil for use in screen printing which method comprises the successive steps of:
(a) providing a screen mesh supported under tension;
(b) placing a radiation-transmitting sheet material adjacent or in contact with one surface of the mesh;
(c) applying a liquid photopolymizable composition to one surface of the mesh while the other surface of the mesh is in contact with a radiation transmitting sheet material such that the mesh apertures are substantially filled with said liquid composition;
(d) imagewise exposing the mesh coated with the liquid composition to radiation through the said sheet material to polymerize the composition on the mesh in the exposed areas, and



(e) separating the sheet material from the mesh substantially to remove any of said liquid composition remaining in the unexposed areas with the sheet material while the polymerized composition remains on the mesh in the exposed areas to form the stencil for use in screen printing.

4,216,020
CARBONACEOUS BRICKS AND THE METHOD FOR PRODUCING THE SAME

Akira Watanabe; Tetsuya Sugimoto, both of Okayama; Yukio Kusaka; Noboru Shinoda, both of Bizen, and Takanori Shimizu, Okayama, all of Japan, assignors to Kyusyu Refractories Co., Ltd., Japan

Filed Feb. 21, 1979, Ser. No. 13,478
Claims priority, application Japan, Aug. 26, 1978, 53-104292
Int. Cl.² C04B *35/52*
U.S. Cl. 106—56 **4 Claims**

1. Carbonaceous bricks containing 40～100 weight % of pellets consisting of carbonaceous material containing substantially more than 70 weight % of carbon and a bonding agent comprising pulverized phenol resin, liquid thermosetting resin and/or setting accelerator, the amount of carbon in the ultimately completed bricks being more than 40 weight %.

4,216,021
HIGH STRENGTH SILICON NITRIDE SINTERED MATERIAL

Yoshinori Hattori, and Yasushi Matsuo, both of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 4, 1979, Ser. No. 35,970
Claims priority, application Japan, May 8, 1978, 53-54835
Int. Cl.² C04B *35/58*
U.S. Cl. 106—73.2 **2 Claims**

1. A high strength silicon nitride sintered material having a modulus of rupture of about 100 kg/mm² or more, which consists essentially of about 88.7 to 98 wt% of Si_3N_4 and the balance consisting essentially of Al_2O_3, Y_2O_3 and TiN in amounts by weight which satisfy the following proportions:

$$\frac{Al_2O_3}{Y_2O_3} = \text{about } 0.25 \text{ to } 4.0$$

$$\frac{Al_2O_3 + Y_2O_3}{Al_2O_3 + Y_2O_3 + TiN} = \text{about } 0.44 \text{ to } 0.97$$

4,216,022
WELL CEMENTING IN PERMAFROST

William N. Wilson, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 18, 1979, Ser. No. 40,349
Int. Cl.² C04B *7/32*
U.S. Cl. 106—104 **5 Claims**

1. A cementitious mix for use in cementing in a permafrost

region of a wellbore consisting essentially of from about 40 to about 60 weight percent aluminate cement, from about 20 to about 30 weight percent of at least one alkaline earth metal sulfate, from about 10 to about 30 weight percent of at least one halide salt of an alkali metal and/or alkaline earth metal, from about 3 to about 8 weight percent attapulgite, from about 0.1 to about 1 weight percent of a mixture of at least one water soluble hydroxy carboxylic acid and a sulfoalkylated lignin, and from about 0.1 to about 1 weight percent of at least one alkali metal citrate, all weight percents being based upon the total weight of the mix.

4,216,023

ZINC SULFIDE BASED PIGMENTS CONTAINING SELENIUM

George P. Kinstle, 4149 Hart Road, Richfield, Ohio 44286, assignor to Ferro Corporation, Cleveland, Ohio

Filed Feb. 12, 1979, Ser. No. 11,077
Int. Cl.[2] C09C *1/04*
U.S. Cl. 106—293 **14 Claims**

1. In a pigment comprising a zinc sulfide host containing in solid solution a sufficient amount of copper indium sulfide to alter the color of the zinc sulfide; the improvement comprising substituting selenium in said copper indium sulfide for at least some of the sulfur up to all of said sulfur, said substitution of selenium causing a shift in the color response curve of said pigment determined by plotting wave length against percent reflectance.

4,216,024

PROCESS FOR PRODUCING MINERAL FILLERS WITH GRAFT PEROXY GROUPS FOR POLYMERS

Sergei S. Ivanchev, ulitsa Nalichanaya, 36/3, kv. 97, Leningrad; Nikolai S. Enikolopov, Kutuzovsky, prospekt, 26, kv. 425, Moscow; Boris V. Polozov, prospekt Smirnova, 20/3, kv. 32, Leningrad; Anatoly A. Syrov, ulitsa III Internatsionala, 52, kv. 51, Leningrad; Oleg N. Primachenko, Suzdalsky prospekt, 38/1, kv. 13, Leningrad, and Zorislav N. Polyakov, ulitsa Petra Smorodina, 18, kv. 8, Leningrad, all of U.S.S.R.

Filed Nov. 20, 1978, Ser. No. 962,205
Claims priority, application U.S.S.R., Dec. 6, 1977, 2546853
Int. Cl.[2] C09C *1/28*
U.S. Cl. 106—308 Q **2 Claims**

1. A process for producing mineral fillers with graft peroxide groups for polymers comprising treatment of mineral fillers which have been dried to a constant weight, at a temperature within the range of from 50° to 150° C. under a pressure of from $1.33.10^2$ to 4.10^5 Pa, (1 mm Hg to 4 atm) with silicone compounds selected from the group consisting of compounds of the formula:

$R_{4-y}SiX_y$ or $R'R_{3-z}SiX_z$, wherein

R is selected from the group consisting of vinyl, allyl, norbornyl,

X is selected from the group consisting of chlorine, an alkoxy or acyloxy,

y=1–3

z=1–2

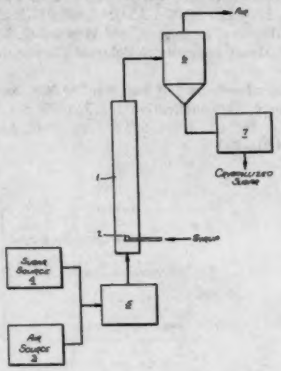
R′ is selected from the group consisting of methyl, ethyl, propyl, followed by separation of the mineral filler containing graft unsaturated groups from the resulting reaction mixture, drying thereof and ozonization with an ozone-oxygen mixture containing 4 to 6 vol.% of ozone at a temperature within the range of from −40° to +20° C.

4,216,025

SUGAR CRYSTALLIZATION PROCESS

Anthony Monti, c/o Revere Sugar Corporation, 120 Wall St., New York, N.Y. 10005

Continuation-in-part of Ser. No. 862,021, Dec. 19, 1977, abandoned. This application Apr. 3, 1979, Ser. No. 26,736
Int. Cl.[2] C13F *1/00*
U.S. Cl. 127—61 **7 Claims**



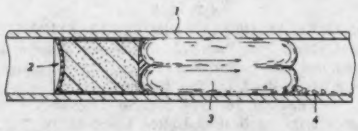
1. Method for crystallizing sugar from a super-saturated syrup of a crystallizable sugar, the syrup having a total solids content of at least 75 weight percent, and the syrup having a crystallizable sugar content of at least 85 weight percent of the total solids in said syrup, which comprises spraying said super-saturated syrup at elevated temperature greater than about 250° F. in the form of droplets of syrup having sizes of from about 50 to 500 microns, into a flowing gas stream having a temperature of less than about 200° F., whereby droplets of syrup crystallize to form solid sugar particles, and removing said droplets and crystallized solid sugar particles from the spray zone by pneumatic transport in said gas stream.

4,216,026

SYSTEM FOR REMOVING FLUID AND DEBRIS FROM PIPELINES

Paul R. Scott, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 5, 1979, Ser. No. 8,990
Int. Cl.[3] B08B *9/04*
U.S. Cl. 134—4 **21 Claims**

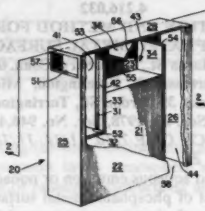


1. A method for removing fluid and/or particulate debris from a pipeline with a Bingham plastic plug comprising, inserting the plug into the pipeline, moving the plug through the pipeline by a circulating motion essentially generating a closed toroid of Bingham plastic, the wall of the toroid adjacent the wall of the pipeline remaining relatively stationary and the center of the toroid moving in the direction of motion of the plug, and collecting the fluid and/or particulate debris with the plug.

4,216,027
METHOD AND APPARATUS FOR CLEANSING AND DISINFECTING A FLUSHING TOILET

Dwight E. Wages, Terrace Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 18, 1978, Ser. No. 897,479
Int. Cl.[2] B08B 3/08; E03D 9/03
U.S. Cl. 134—36 12 Claims



1. A method for cleansing and disinfecting a flushing toilet containing water and comprising a toilet tank and a toilet bowl each time said toilet is flushed, said method comprising:

(a) forming a quantity of surfactant containing solution by exposing a first solid, water soluble, surfactant containing cake to a first quantity of said water within a first passive dispensing apparatus immersed in said toilet tank;

(b) isolating said first cake and said surfactant containing solution in said first passive dispensing apparatus from the water surrounding said first dispensing apparatus;

(c) forming a quantity of disinfectant containing solution by totally immersing a second solid, water soluble disinfectant containing cake in a second quantity of said water within a second passive dispensing apparatus immersed in said toilet tank;

(d) isolating said second cake and said disinfectant containing solution in said second passive dispensing apparatus from the water surrounding said second dispensing apparatus;

(e) flushing said toilet, thereby lowering the water level in said toilet tank from a first elevation to a second elevation;

(f) discharging a predetermined quantity of said surfactant containing solution of substantially constant strength from said first passive dispensing apparatus in response to the water level in said toilet tank being lowered from said first elevation to said second elevation; and

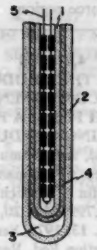
(g) discharging a predetermined quantity of said disinfectant containing solution substantially free of undissolved solids from said second passive dispensing apparatus in response to the water level in said toilet tank being lowered from said first elevation to said second elevation.

4,216,028
THERMOCOUPLE PROTECTING TUBE

Sumihiko Kurita, Arita, Japan, assignor to Koransha Co., Ltd., Arita, Japan

Division of Ser. No. 831,313, Sep. 7, 1977, Pat. No. 4,135,538.
This application Aug. 9, 1978, Ser. No. 932,169
Claims priority, application Japan, Nov. 30, 1976, 51/160660
Int. Cl.[2] H01L 35/02
U.S. Cl. 136—234 3 Claims

1. In a thermocouple protecting tube for continuously measuring the temperature of molten steel comprising a single ceramic tube having one end closed and containing a thermocouple element therein, the improvement wherein said tube is comprised of chromium oxide in an amount of about 1 to 35% by weight and alumina in an amount of about 99 to 65% by

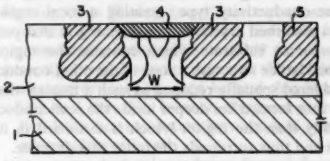


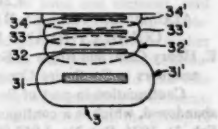
weight, said chromium oxide and alumina being initially mixed together and sintered to form said ceramic tube.

4,216,029
METHOD OF MAKING STATIC INDUCTION TRANSISTOR LOGIC

Toshimi Ohki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Mar. 21, 1978, Ser. No. 888,621
Claims priority, application Japan, Mar. 28, 1977, 52-34185
Int. Cl.[2] H01L 29/78, 29/80
U.S. Cl. 148—1.5 4 Claims





1. A method of fabricating a static induction transistor logic device, comprising:

providing a semiconductor substrate having a high impurity concentration of a first conductivity type;

forming a semiconductor layer on a surface of said substrate having a low impurity concentration on the order of an intrinsic semiconductor and of the first conductivity type;

forming a semiconductor region having a high impurity concentration of the first conductivity type in a surface of said semiconductor layer formed on said substrate, wherein the semiconductor region having a high impurity concentration of the first conductivity type constitutes a drain region of the device;

forming by ion implantation a semiconductor region having a high impurity concentration of a second conductivity type opposite said substrate in the semiconductor layer and concentric with the drain region beneath the surface of the semiconductor layer; and

diffusing the ion implanted region within the semiconductor layer to form a semiconductor region having a high impurity concentration of the second conductivity type in the

semiconductor layer and surrounding the drain region at the surface of the semiconductor layer and having a tube-like shape extending downward into the semiconductor layer toward the source region.

4,216,030

PROCESS FOR THE PRODUCTION OF A SEMICONDUCTOR COMPONENT WITH AT LEAST TWO ZONES WHICH FORM A PN-JUNCTION AND POSSESS DIFFERING CONDUCTIVITY TYPES

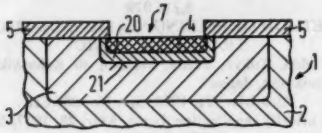
Juergen Graul, Gruenwald, and Helmut Müeller, Fuerstenfeldbruck, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 798,799, May 20, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,096

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1976, 2627855

Int. Cl.[2] H01L *21/265, 21/26*

U.S. Cl. 148—1.5 **17 Claims**



1. A process for the production of a semiconductor component which includes taking a monocrystalline semiconductor substrate of one conductivity type, creating a local region therein having a disturbed crystal lattice, forming in that part of said semiconductor substrate which contains the region having a disturbed lattice structure a zone of the other conductivity type considered spatially redoped in such a manner that the pn-junction thus formed lies deeper inside the semiconductor substrate body than the region which is disturbed in its lattice structure and thus surrounds the latter at a distance.

4,216,031

ALUMINUM NICKEL BASE ALLOY ELECTRICAL CONDUCTOR AND METHOD THEREFOR

E. Henry Chia, and Roger J. Schoerner, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 702,423, Jul. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 444,497, Feb. 21, 1974, Pat. No. 3,967,983, which is a division of Ser. No. 160,189, Jul. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 147,196, May 26, 1971, abandoned. This application Jan. 23, 1978, Ser. No. 871,617

The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.

Int. Cl.[2] C22F *1/04*

U.S. Cl. 148—2 **7 Claims**

4. Method of preparing an aluminum base alloy electrical conductor having a minimum conductivity of at least 57% IACS comprising the steps of:

A. preparing an alloy consisting essentially of from about 0.55 to about 0.65 weight percent nickel, the remainder aluminum with associated trace elements, said conductor alloy having no more than 0.15 weight percent iron, no more than 0.001 weight percent magnesium and no more than 0.05 weight percent copper to obtain improved ductility over aluminum-nickel alloys having greater percentages of the aforesaid iron, magnesium and copper:

B. casting the alloy in a moving mold formed between a groove in the periphery of a rotating casting wheel and a metal belt lying adjacent said groove for a portion of its length;

C. hot rolling the cast alloy substantially immediately after casting while the cast alloy is in substantially that condition as cast to form a continuous rod;

said aluminum alloy conductor being substantially free of splits and cracks and having a tensile strength of at least 12,000 PSI, and a yield strength of at least 8,000 PSI when measured as a fully annealed wire, and has good thermal stability characteristics.

4,216,032

OIL COMPOSITION AND METHOD FOR TREATING PHOSPHATED METAL SURFACES

Jacob Hyner, 58 Moran St., Waterbury, Conn. 06704; Jacob M. Hage, 29523 Ravenscroft, Farmington, Mich. 48018, and Stephen Gradowski, 39 Jardon St., Torrington, Conn. 06790

Filed Sep. 27, 1978, Ser. No. 946,460

Int. Cl.[2] C23F *7/10, 11/14, 11/18*

U.S. Cl. 148—6.15 Z **8 Claims**

1. In an improved aqueous emulsion or nonaqueous solution of oil for treatment of phosphated metal surfaces to improve corrosion resistance, the improvement comprising an effective amount of polyvinylpyrrolidone and dispersed metallic zinc powder.

6. An improved method for providing superior corrosion resistance to a phosphated metal surface comprising application of the improved composition of claim 1 to said phosphated metal surface.

4,216,033

METHOD OF NITRIDING STEEL

Herbert E. Knechtel, Monroeville Borough, and Harry H. Podgurski, Greensburg, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 973,501

Int. Cl.[2] C21D *1/48*

U.S. Cl. 148—16.6 **13 Claims**

1. In the process of nitriding the surface of steel within a nitriding furnace wherein a binary gas mixture of ammonia and hydrogen having a nitrogen activity of from 0.2 to 1.8 atmos. $-\frac{1}{2}$ is circulated over the steel surface at substantially atmospheric pressure and at a temperature within the range 475 to 550° C., the improvement comprising utilizing a nitriding furnace having a lining consisting of a structural metal or alloy coated with a non-porous, non-friable high temperature material which will not crack ammonia to H_2 and N_2, adding water to the binary gas mixture to provide a water content of from 1 to 3 volume percent and utilizing a gas flow rate of from 5 to 200 cu. ft. per hour per 100 sq. ft. of steel surface area being nitrided.

4,216,034

PROCESS FOR THE PRODUCTION OF A HARD SOLID SOLUTION

Masaya Miyake; Minoi Nakano; Takaharu Yamamoto, and Akio Hara, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 25, 1978, Ser. No. 927,903

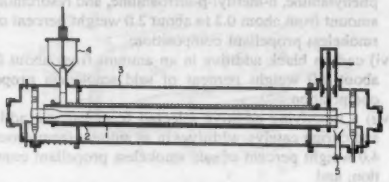
Claims priority, application Japan, Jul. 27, 1977, 52-90618; Sep. 13, 1977, 52-111005; Nov. 29, 1977, 52-143176; Dec. 29, 1977, 52-159300; Apr. 28, 1978, 53-52050; May 17, 1978, 53-59142

Int. Cl.[2] C22C *29/00*

U.S. Cl. 148—20.3 **15 Claims**

1. A process for the production of a solid solution containing tungsten, molybdenum, the proportion of molybdenum being at least 10 mol % based on metallic components in the solid solution, and at least one non-metallic element selected from the group consisting of carbon and nitrogen, said solid solution having a crystalline structure of a simple hexagonal WC type, which process comprises mixing molybdenum and tungsten in the form of compounds selected from the group consisting of oxides, hydroxides, chlorides, sulfates, nitrates, metallic acids and salts thereof, adding carbon, and optionally at least one

member selected from the group consisting of hydrogen, nitrogen, oxygen, sulfur, phosphorus, fluorine, chlorine, bromine, arsenic, selenium, boron and silicon, to the mixture, subjecting the resulting mixture to a reducing reaction with the carbon,



and then subjecting the thus obtained mixture to a solid solution-forming treatment in an atmosphere selected from the group consisting of reducing, carburizing and nitriding atmospheres.

4,216,035

REMOVABLE PROTECTIVE COATING AND PROCESS OF USING SAME

Peter Bakos; Roger E. Haggett, both of Endicott, and Richard M. Poliak, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,073
Int. Cl.² B23K *35/34*
U.S. Cl. 148—23 **31 Claims**

1. A film-forming composition which is readily removable from a substrate by washing with a solvent which comprises:

(A) an organic flux material selected from the group of shellac, rosin, polyalkylene glycol, polyalkylene glycol monoester, polyalkylene glycol monoether, and mixtures thereof; and

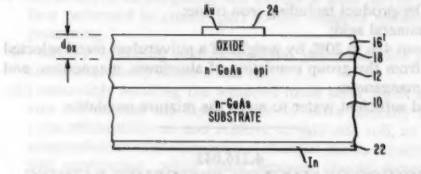
(B) a component selected from the group consisting of organic carboxylic acid anhydride, aldehyde and mixtures thereof in an amount sufficient to promote wetting of the film-forming composition, and wherein said flux base material and said component are mutually soluble with each other.

4,216,036

SELF-TERMINATING THERMAL OXIDATION OF AL-CONTAINING GROUP III-V COMPOUND LAYERS

Won-Tien Tsang, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 28, 1978, Ser. No. 937,318
Int. Cl.² H01L *21/203*
U.S. Cl. 148—175 **13 Claims**



1. A method of forming an oxide layer (16') on a major surface of non-Al-containing Group III–V compound body (14) characterized by the steps of:

(a) forming an Al-containing Group III-V compound layer (16) on said major surface; and

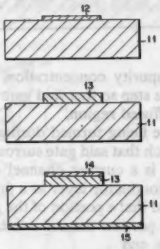
(b) thermally oxidizing said Al-containing layer for a time period sufficient to convert said layer to an oxide layer, said oxidizing being essentially selfterminating at said surface.

4,216,037

METHOD FOR MANUFACTURING A HETEROJUNCTION SEMICONDUCTOR DEVICE BY DISAPPEARING INTERMEDIATE LAYER

Takashi Katoda, 1-3-4, Suwada, Ichikawa-shi, Chiba-ken, Japan, and Masato Kishi, Tokyo, Japan, assignors to Takashi Katoda, Chiba, Japan

Filed Jan. 5, 1979, Ser. No. 1,170
Claims priority, application Japan, Jan. 6, 1978, 53/208; Jan. 6, 1978, 53/209; Aug. 25, 1978, 53/103673
Int. Cl.² H01L *31/18*
U.S. Cl. 148—175 **3 Claims**



1. A method for manufacturing semiconductor device, comprising the steps of:

forming a thin film layer on at least a portion of the principal surface of a substrate, said thin film layer having a thickness ranging between 100 and 500 A; and

growing a semiconductor layer on the portion of said substrate previously covered by said thin film layer permitting said thin film layer to disappear thereby forming a two layer heterojunction between said substrate and said semiconductor layer;

said semiconductor layer being formed from a compound semiconductor;

said thin film layer comprising at least one element, said element being selected from the group consisting of elements of the same group of the periodic table as the higher numbered group element of said compound semiconductor, and any additional element present in said thin film layer being selected from the group consisting of elements of the groups of the periodic table other than the group of the lower numbered group element of said compound semiconductor.

4,216,038

SEMICONDUCTOR DEVICE AND MANUFACTURING PROCESS THEREOF

Jun-ichi Nishizawa, Sendai; Yasunori Mochida, Hamamatsu; Terumoto Nonaka, Hamamatsu; Tadahiko Hotta, Hamamatsu, and Shin Yamashita, Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 5, 1978, Ser. No. 913,006
Claims priority, application Japan, Jun. 11, 1977, 52-69325
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **11 Claims**

1. A process for manufacturing a field effect transistor in a semiconductor wafer including a semiconductor region having a first conductivity type and a low impurity concentration, which process comprises the steps of:

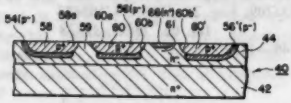
(a) forming, on one surface of said semiconductor region, a double-mask layer from a first film and a second film superposed on said first film, and having an aperture formed through said double-mask layer;

(b) diffusing an impurity element of a predetermined first

conductivity type into said semiconductor region through said aperture to form a diffused region having said first conductivity type and a predetermined impurity concentration;

(c) selectively etching said first film through said aperture and widening at least partially the aperture on said first film, thereby obtaining a new aperture on said first film;

(d) diffusing an impurity element of a second conductivity type opposite to said first conductivity type into said semiconductor region through said new aperture to form a gate of said transistor having second conductivity type



and a high impurity concentration, and controlling the diffusion in this step so that said gate has a depth less than that of said diffused region,

said new aperture being formed during said step (c) having a dimension such that said gate surrounds a predetermined region, which is a current channel of said transistor, of said first semiconductor layer at a predetermined portion of said gate, and that a portion of the gate exclusive of said predetermined portion thereof overlaps a portion of said diffused region; and

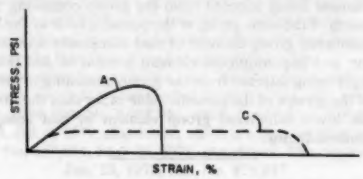
(e) forming, at one end of said current channel, a drain for said transistor having said first conductivity type.

4,216,039

SMOKELESS PROPELLANT COMPOSITIONS HAVING POLYESTER OR POLYBUTADIENE BINDER SYSTEM CROSSLINKED WITH NITROCELLULOSE

Everette M. Pierce, Somerville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 20, 1978, Ser. No. 962,273
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **3 Claims**



1. A smokeless propellant composition having a binder system crosslinked with nitrocellulose comprising:

(i) one or more binder ingredients selected from the group of binder ingredients consisting of polyglycol adipate, polyethylene glycol, polycapralactone, and hydroxy-terminated polybutadiene in an amount from about 1 to about 10 weight percent of said smokeless propellant composition;

(ii) nitrocellulose which functions as a crosslinking agent for said binder ingredients in an amount from about 0.1 to 1.0 weight percent of said smokeless propellant composition;

(iii) plasticizer ingredients selected from the nitrate ester plasticizers consisting of nitroglycerin, trimethylol ethane trinitrate, triethylene glycol dinitrate and butane trioltrinitrate in an amount from about 10 to about 30 weight percent of said smokeless propellant composition;

(iv) an oxidizer ingredient selected from the group of oxidizer ingredients consisting of cyclotetramethylenetetranitramine, cyclotrimethylenetrinitramine, triaminoguanidine nitrate, and oxamide in an amount from about 10 to about 80 weight percent of said smokeless propellant composition;

(v) thermal stabilizers selected from the group of thermal stabilizers consisting of 2-nitrodiphenylamine, 4-nitrodiphenylamine, n-methyl-p-nitroaniline, and resorcinol in an amount from about 0.2 to about 2.0 weight percent of said smokeless propellant composition;

(vi) carbon black additive in an amount from about 0.1 to about 1.0 weight percent of said smokeless propellant composition;

(vii) a modifying additive selected from ballistic additives and curing catalyst additives in an amount from about 0 to 4.0 weight percent of said smokeless propellant composition; and

(viii) an isocyanate curing agent in an amount from about 0.3 to about 2.0 weight percent of said smokeless propellant composition.

4,216,040

EMULSION BLASTING COMPOSITION

Walter B. Sudweeks, Orem, and Harvey A. Jessop, Lehi, both of Utah, assignors to IRECO Chemicals, Salt Lake City, Utah

Continuation-in-part of Ser. No. 883,077, Mar. 3, 1978, Pat. No. 4,141,767. This application Jan. 19, 1979, Ser. No. 4,958
Int. Cl.[2] C06B *45/02*
U.S. Cl. 149—21 **9 Claims**

1. A water-in-oil emulsion blasting composition comprising a water-immiscible liquid organic fuel as a continuous phase, an emulsified aqueous inorganic oxidizer salt solution as a discontinuous phase, and from about 0.2% to about 5.0% by weight, based on the total composition, of an organic cationic emulsifier having a hydrophilic portion and a lipophilic portion, when the lipophilic portion is an unsaturated hydrocarbon chain.

4,216,041

ENERGY PRODUCING WASTE MATERIAL COMPOSITION AND METHOD OF PREPARATION

Paul A. Deardorff, 1128 Dix, Lincoln Park, Mich. 48146; Robert C. Wood, 36002 Huron River Dr., New Boston, Mich. 48164, and Sante M. Cundari, 530 Woodcrest, Dearborn, Mich. 48124

Continuation-in-part of Ser. No. 901,492, May 1, 1978. This application Jul. 10, 1978, Ser. No. 923,054
Int. Cl.[2] C06B *33/00, 21/00*
U.S. Cl. 149—44 **27 Claims**

1. A composition for the production of heat and for the combustion and reaction of processed sewage sludge cake, said composition comprising, the reaction product of mixing:

less than about 40% by weight sewage sludge cake;

at least about 40% by weight of an iron-containing by-product from the production of steel said iron-containing by-product including iron oxide;

a mineral acid;

about 4% to 20% by weight of a pulverulent metal selected from the group consisting of aluminum, magnesium, and manganese;

and sufficient water to make the mixture moldable.

4,216,042

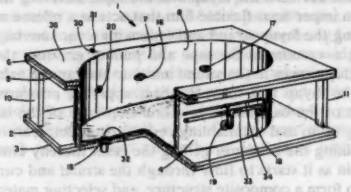
METHOD OF MAKING A PREFORMED BATHING VESSEL

Albert E. Weaver, 15001 Calvert, Van Nuys, Calif. 91411

Filed Feb. 17, 1978, Ser. No. 878,740
Int. Cl.[2] A47K *3/00*
U.S. Cl. 156—62.2 **9 Claims**

1. A method of manufacturing a custom bathing vessel which comprises, at a first manufacturing location, building a structural wood form by fabricating a generally flat wood base member and a plurality of wood wall members, attaching said

base and wall members, boring holes in the form to receive utilities, mounting utility fixtures in the form, coating an interior surface of the form with a fiberglass/resin mixture, allowing said mixture to harden and adhere to the form, and shipping the vessel to a second location for installation.

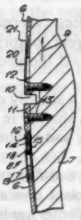


8. The method of claim 1 comprising building the wood form and applying the fiberglass/resin mixture at said first location, transferring the form to said second location, installing the form permanently in said second location, and applying a water-impervious decorative coating over said fiberglass/resin mixture at said second location.

4,216,043
EMBOSSED PATTERNING OF ASBESTOS-CEMENT AND LIKE SHEETS

Warwick H. Gazzard, St. Ives, and Roger M. Kearin, Galston, both of Australia, assignors to James Hardie & Coy. Pty. Limited, Sydney, Australia

Division of Ser. No. 629,539, Nov. 6, 1975, Pat. No. 4,072,460.
This application Oct. 25, 1977, Ser. No. 845,023
Claims priority, application Australia, Nov. 7, 1974, PB9519
Int. Cl.[2] B29D *9/00*
U.S. Cl. 156—193 **3 Claims**



1. A method of producing sheets of fiber-reinforced cementitious material with embossed decorative patternings formed thereon, said method comprising the steps:

(a) forming a flat, flexible mold layer whereof the length and breadth are greater than the corresponding dimensions of the sheets to be produced, and having at least part of one face patterned in counterpart to the required embossed patterning,

(b) closely wrapping said mold layer, patterned face out, circumferentially about a size roll,

(c) removably securing the wrapped mold layer about said size roll so that the layer is free to move laterally and circumferentially on and relative to said size roll, to accommodate overall dimensional changes due to expansion and contraction, while being retained closely wrapped about that roll by fixedly securing only one circumferential end of the mold layer to the size roll and only restraining the other circumferential end and the sides of the mold layer against radially outward movement of the mold layer relative to the roll,

(d) building up a sleeve on said wrapped size roll from a web of un-set fiber-reinforced cementitious material,

(e) severing said sleeve in a direction parallel to the roll axis,

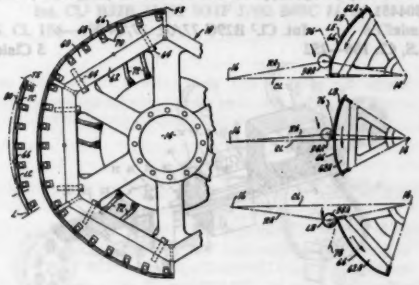
(f) peeling said severed sleeve from said mold layer and size roll with said mold layer being free to move laterally and circumferentially in relation to and on said size roll by utilizing said freedom to move so as to facilitate release of the sleeve from said mold layer, and,

(g) trimming and curing said severed sleeve, including removing edge margins thereof, to provide a cured, flat sheet of the desired dimensions.

4,216,044
METHOD FOR APPLYING A DECORATION TO A CYLINDRICAL BODY

Frank J. Herdzina, Schaumburg, Ill., and Patrick F. Urso, Longview, Wash., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 803,767, Jun. 6, 1977, Pat. No. 4,124,433.
This application Jul. 7, 1978, Ser. No. 923,027
Int. Cl.[2] B29C *17/04;* B32B *3/04*
U.S. Cl. 156—215 **4 Claims**



1. A method for applying a decoration to the outer cylinderical surface of a cylindrical body, said method including the steps of:

rotating said body about its longitudinal axis,

revolving said body with its outer cylindrical surface following the arc of a true circle,

rotating, by means of another moving surface, the leading edge of the decoration into tangential contact with the cylindrical surface of said body at a predetermined point on said arc, while the body is being rotated, to transfer said leading edge of said decoration to said body while continuing to support the decoration on the other surface, and

said other surface being configured to follow said arc while concurrently therewith progressively moving succeeding portions of said decoration into tangential contact with said cylindrical body as the cylindrical body thereafter progresses along said arc from said predetermined point, while it is being rotated, in a direction from the leading edge to the trailing edge until the entire decoration is so transferred.

4,216,045
PROCESS FOR PREPARATION OF ELECTRODE FOR ALKALINE BATTERY

Yuji Morioka, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 16, 1978, Ser. No. 906,340
Claims priority, application Japan, May 18, 1977, 52-58064
Int. Cl.[2] C04B *35/00;* B29C *19/00*
U.S. Cl. 156—242 **10 Claims**

1. A process for preparation of an electrode for alkaline battery comprising the steps of:

(a) forming an intimate admixture consisting essentially of an unsintered fluorocarbon resin powder and a battery electrode forming active material powder;

(b) applying a shear force to said mixture sufficient to cause the fluorocarbon resin to be formed into fibers and to form

agglomerates capable of retaining said active material powder inside a network structure resulting from a fiber-formation of said fluorocarbon resin powder;
(c) adding an aqueous solution of natural or synthetic polymer paste to said agglomerates;
(d) kneading the resulting mixture to mutually bind said agglomerates and thus form a rubbery mass;
(e) converting said rubbery mass into a sheet; and
(f) attaching the sheet so formed onto an electrically conductive core body.

4,216,046

MANUFACTURE OF ARTICLES OF POLYVINYL CHLORIDE FOIL WITH SEALED-IN REINFORCEMENT MATERIAL

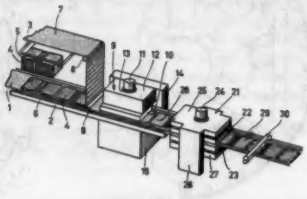
Benjamin M. Hackert, Hillegom, Netherlands, assignor to Draka Plastics B.V., Amsterdam, Netherlands

Filed Apr. 13, 1979, Ser. No. 29,836

Claims priority, application Netherlands, Apr. 26, 1978, 7804451

Int. Cl.² B29C *27/02, 27/04*

U.S. Cl. 156—252 **5 Claims**



1. A method of manufacturing articles of softened polyvinyl chloride reinforced with reinforcement material comprising the steps of

coating one surface of each of two perforated foils of said softened polyvinyl chloride with a terpolymer of vinyl chloride, vinyl acetate and an unsaturated carboxylic acid,

bringing the coated surface of each of said foils into contact with an opposite surface of said reinforcement material,

sealing the portions of said foils situated along the edges of said reinforcement material in a high frequency field to form sealed seams, and

securing the portions of said foils situated between said seams to the surface of said reinforcement material by pressing said foils and reinforcement material at elevated temperature and pressure.

4,216,047

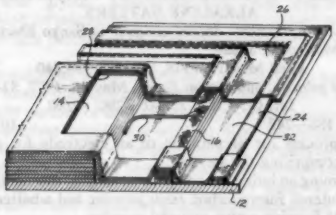
NO-BLEED CURING OF COMPOSITES

Lonnie G. Hilliard, Kent, and Michael J. Sibborn, Bellevue, both of Wash., assignors to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Sep. 15, 1978, Ser. No. 943,253

Int. Cl.² B29C *17/00*

U.S. Cl. 156—285 **12 Claims**



1. A method of making a composite structure with steps comprising: applying parting means to a mold, placing a layup including uncured resin on a mold with said layup to be formed into a composite structure, locating a tape of breather material on the mold with said tape spaced away from the layup, placing a strand of fibers defining a multitude of passages to communicate between the layup and the tape, covering the layup with an impervious flexible film that acts as a release material, covering the layup strand and tape with a vacuum bag, introducing a vacuum in the tape and pulling air from the layup through passages in the strand and into the tape to exhaust air from the layup and from the bag, applying pressure to the outside of the bag, effecting a one step cure of the layup by heating up to and maintaining resin curing temperature while maintaining the pressure, gelling the resin thereby closing off the resin as it starts to flow through the strand and curing the resin to form a composite structure, and selecting materials for the strand from materials capable of withstanding the heat and the pressure of the process without closing off the multitude of air passages.

4,216,048

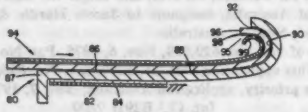
SEPARATING LAMINATED LAYERS

Edward C. Gehweiler, Milwaukee, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 16, 1977, Ser. No. 851,880

Int. Cl.² B32B *35/00, 07/12*

U.S. Cl. 156—344 **3 Claims**



1. A method of separating coterminous layers of a laminate at an end thereof, said layers comprising a flexible layer and a liner with an adhesive bond therebetween, said method comprising

sliding said end around a sharply curved concave surface to bend both said layers sharply in the same direction at said end to cause shearing and lengthwise offset therebetween to weaken said bond,

all of said sliding being end-first in the direction away from said laminate along said concave surface, said bending being carried out by forces applied to one said layer by its sliding contact with said concave surface and without direct guiding of the other said layer at said end, and

then, without allowing said bond to re-form, releasing said end to permit both said layers to spring back from said bending,

the overall orientation being such that, upon release of said end, a differential in the forces that tend to straighten the layers drives apart the shear-weakened adhesive bond.

4,216,049

APPARATUS FOR ASSEMBLING STRIPS OF VENEER

Theodor A. Grönebaum, Rietberg, Fed. Rep. of Germany, assignor to Firma Heinrich Kuper, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,287

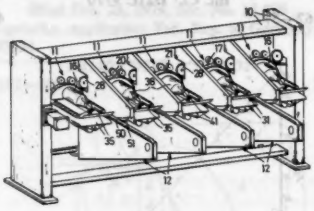
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713522

Int. Cl.² B32B *31/12*; B27M *1/08*; B32B *5/08*; B65H *54/00*

U.S. Cl. 156—433 **14 Claims**

1. An apparatus for assembling strips of veneer by adhesion of adhesive threads to the upper and lower surface of said strips of veneer, comprising a veneer strip feed device and a plurality of thread supplying and alternating devices located in mutually spaced juxtaposition, each of said thread supplying and alternating devices defining a movement plane in which the veneer strips are longitudinally fed and including a pair of

bodies, each body having a circular segment, said bodies being located in spaced relationship at least partially defining an adjustable passage for the veneer strips therebetween along said plane of veneer strip movement, said bodies being mounted for associated rotation about an axis of rotation which extends in the direction of and in said plane of veneer strip movement, said circular segments of each pair of bodies which define a thread supplying and alternating device being located in a plane extending substantially perpendicularly to said plane of veneer strip movement and their outer peripheries defining a circular shape, each of said thread supplying and alternating devices including a pair of elongated thread guides for guiding the adhesive threads on both sides of the veneer strips, each one of each pair of thread guides being associated with a re-



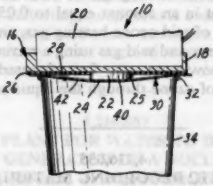
spective one of said circular segment bodies and extending substantially in the direction of movement of the veneer strips on a respective side of said movement plane, means associated with said thread guides for heating the adhesive threads, common drive means for rotating said circular segment bodies about said axis of rotation, and means located behind each of said thread supplying and alternating devices in the direction of movement of the veneer strips for pressing the adhesive threads against the surfaces of the veneer strips, whereby said thread guides are reversibly displaceable in association with said rotatable circular segment bodies from a first position on one side of said movement plane to a second position on the other side of said movement plane thereby intersecting said movement plane during such displacement.

4,216,050

HEAT SEALING PLATEN

Paul F. Schmit, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 21, 1978, Ser. No. 917,586
Int. Cl.² B30B *15/02, 15/34*
U.S. Cl. 156—494 **4 Claims**



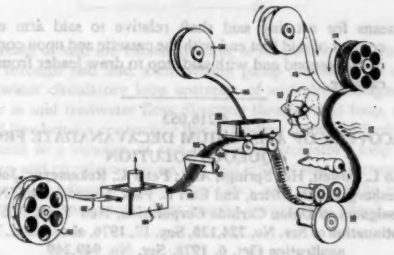
1. In a platen adapted to seal a piece of heat sealable film to the lip of a cup, comprising a heat conductive rigid support member; a layer of resiliently elastic material overlying said support member and having an annular outer surface adapted to press and conform film against the lip of a said cup; and means for heating said support member and said elastic material to provide a temperature at the annular outer surface of said elastic material adapted to seal film to the lip of the cup, the improvement wherein said platen is adapted for use with a said film which will shrink a small amount when heated to normal heat sealing temperatures; and has a projection surrounded by the annular outer surface of said resiliently elastic material, said projection having a surface portion heated by said means for heating to a temperature exceeding that of said annular outer surface and adapted to contact and selectively shrink film as the film is sealed to the cup to form in the sealed film a contracted planar portion surrounded by radially extending ridges and grooves which draw attention to the planar portion of the film.

4,216,051

APPARATUS FOR MAKING BONDABLE FINGER CONTACTS

Vernon L. Brown, Boulder; Wade H. Greenwood, Northglenn, and Gary L. Griffith, Arvada, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 891,038, Mar. 28, 1978, Pat. No. 4,179,322.
This application Jul. 11, 1979, Ser. No. 56,534
Int. Cl.² B32B *31/00*; B31F *5/00*; B65C *11/04*
U.S. Cl. 156—499 **8 Claims**



1. Apparatus for making bondable finger contacts for application to a printed circuit board including means for forming a strip of virtually continuous, flat, electrically conductive material so as to produce a plurality of spaced-apart finger contacts integral with and interconnected by at least one support carrier, each of said finger contacts having a contact region thereon characterized in that the apparatus further includes:

means for applying a tape having an adhesive on one side thereof to one side of the contact region of said plurality of contacts to protect, interconnect and support said contacts; and

means for applying a coat of adhesive to an opposite side of said contact region of said plurality of contacts to facilitate bonding said contacts to said circuit board.

4,216,052

AUTOMATIC THREADING MECHANISM FOR A CASSETTE LOADER

Darrell W. Zielke, Valencia, Calif., assignor to West American Sound, Inc., North Hollywood, Calif.

Filed Oct. 30, 1978, Ser. No. 956,219
Int. Cl.² B65H *19/00*
U.S. Cl. 156—502 **20 Claims**

1. An automatic threading mechanism for a cassette loader, comprising

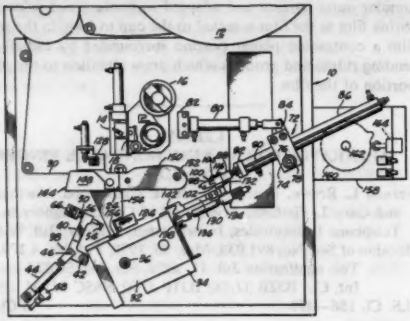
an arm pivotally mounted to the cassette loader;

a drive means for pivoting said arm in either direction;

a shaft slidably mounted to said arm at a distal end of said arm and oriented substantially tangentially to the arc of pivotal movement of said distal end of said arm, said arm being located on the cassette loader to allow a first end of said shaft to contact a cassette mounted on the cassette loader immediately adjacent the leader of the cassette and said shaft having adjacent said first end a member extending perpendicularly to said shaft;

a stop positioned to limit pivotal movement of said arm away

from the cassette by intercepting a second end of said shaft; and



means for rotating said shaft relative to said arm upon contact of said first end with the cassette and upon contact of said second end with said stop to draw leader from the cassette.

4,216,053

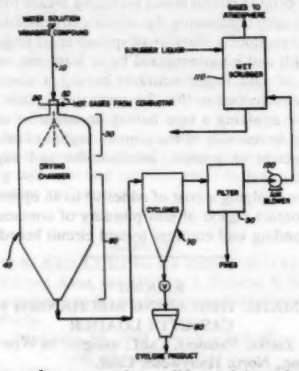
RECOVERY OF AMMONIUM DECAVANADATE FROM AQUEOUS SOLUTION

John L. Powell, Hot Springs, Ark.; Peter C. Rekemeyer, Johannesburg, South Africa, and Earl E. Falk, Grand Island, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 724,135, Sep. 17, 1976, abandoned. This application Oct. 6, 1978, Ser. No. 949,249

Int. Cl.[2] B01D *1/18*

U.S. Cl. 159—48 R **2 Claims**



1. Process for recovering solid particles of ammonium decavanadate from a solution consisting essentially of ammonium decavanadate dissolved in water which comprises

(i) atomizing said ammonium decavanadate solution to provide fine droplets of said ammonium decavanadate solution

(ii) introducing said fine droplets of said solution into a stream of gas which passes into and through a vessel having a heated zone which is at a temperature in the range of about 300° C. to 750° C. to thereby vaporize the water constituent of said droplets and provide fine sized ammonium decavanadate particles of about 0.5 to 100 microns and water vapor which exit said heated zone in said stream of gas

(iii) passing said stream of gas and the thus provided fine sized ammonium decavanadate particles and water vapor which exit the heated zone into and through a contiguous cooling zone in said vessel which is at a temperature below about 250° C. to avoid decomposition of said ammonium decavanadate particles

(iv) recovering said solid fine sized ammonium decavanadate particles exiting said cooling zone.

4,216,054

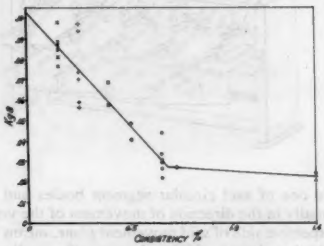
LOW-CONSISTENCY OZONE DELIGNIFICATION

Jozef M. Bentvelzen; Steven L. Bogart, both of Everett; Maharaj K. Gupta, Renton; William T. McKean, Lynnwood; Michael D. Meredith, Snohomish, and Louis O. Torregrossa, Puyallup, all of Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Sep. 26, 1977, Ser. No. 836,449

Int. Cl.[2] D21C *9/10*

U.S. Cl. 162—57 **49 Claims**



1. The process of bleaching cellulosic fibers comprising:

forming a slurry by placing said cellulosic fibers in a solvent consisting essentially of water having an initial pH of 2 to 8, said fibers being present in said slurry in an amount in the range of 0.017 to about 0.7%, on an oven-dry basis, of the total ungassed weight of said slurry;

charging an ozone bearing gas to said slurry, said ozone being present in an amount equal to 0.05 to 23% of the total weight of said ozone bearing gas;

mixing said slurry and said gas using a mixing energy of 0.002 to 0.4 horsepower per cubic foot of gassed slurry wherein the transfer of ozone through the gas-liquid interface is facilitated.

13. The process of bleaching cellulosic fibers comprising:

forming a slurry by placing said cellulosic fibers in a solvent consisting essentially of water having an initial pH of 2 to 8, said fibers being present in said slurry in an amount in the range of 0.017 to about 0.7%, on an oven-dry basis, of the total ungassed weight of said slurry;

charging an ozone bearing gas to said slurry, said ozone being present in an amount equal to 0.05 to 23% of the total weight of said ozone bearing gas, and

mixing said slurry and said gas using a mixing energy of 0.2 to 1.0 horsepower per cubic foot of gassed slurry wherein the transfer of ozone through the liquid-solid interface is facilitated.

4,216,055

ELECTROSTATIC RECORDING MATERIAL AND THE METHOD OF PREPARING IT

Noritoshi Watanabe; Riyozo Yamamoto; Isao Shoji, and Hisanori Yagi, all of Hyogo, Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 750,407, Dec. 14, 1976, abandoned. This application Sep. 25, 1978, Ser. No. 945,340

Claims priority, application Japan, Dec. 25, 1975, 50-158187

Int. Cl.[2] D21H *5/00*

U.S. Cl. 162—117 **12 Claims**

1. An electrostatic recording material having transparency which comprises an electroconductive base sheet having a dielectric layer thereon, said base sheet being obtained by the

steps of preparing a paper from an aqueous suspension of natural pulp having a CSF within the range of 200 to 600 cc, moistening said paper so as to have a moisture content within the range of 5 to 30%, and calendering said moistened paper with the use of a heated embossing metal roll to transparentize said moistened paper and form a finely embossed surface thereon, said embossing metal roll having a peripheral surface engraved so as to have a surface roughness of a Rmax of 20 to 160 microns and a relief peak number of 2 to 15 per 1 mm.

4,216,056

PAPER MACHINE HAVING A WATER EXTRACTION BOX EXTENSION

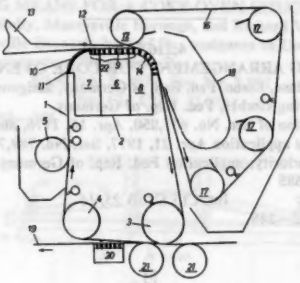
Erik A. Nykopp, Tampere, Finland, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,495

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807894

Int. Cl.[2] D21F *1/36, 1/52*

U.S. Cl. 162—300 **20 Claims**



1. In a paper machine having a continuous inner wire cloth loop and a continuous outer wire cloth loop which are passed together around a surface part of a deflecting component located within the inner wire cloth loop for effecting extraction of water through the outer and possibly inner wire cloths, a water extraction box located within the inner wire cloth loop in front of the deflecting component, relative to the direction of movement of the inner cloth, and having a support surface, and a breast box having an upper lip which lies adjacent the inner wire cloth in the vicinity of the water extraction box and defines, with said extraction box support surface, a fibrous web forming and preliminary water extraction zone into which water can be extracted through the inner wire cloth into the water extraction box, the improvement whereby the upper lip of said breast box has a substantially rectilinear inner surface, and in that said deflecting component is a stationary part providing an extension of said water extraction box immediately after the preliminary water extraction zone, relative to the direction of movement of said inner wire cloth.

4,216,057

PURIFYING PLANT FOR WATER TO BE VAPORIZED IN A STEAM GENERATOR OF A NUCLEAR REACTOR

Hans-Günter Heitmann, Erlangen-Buckenhof, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

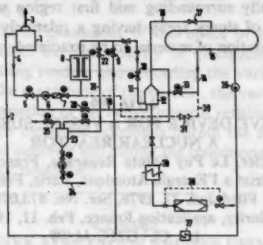
Filed Dec. 5, 1977, Ser. No. 857,702

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656096

Int. Cl.[2] G21D *1/02*

U.S. Cl. 176—37 **2 Claims**

2. In a purification system for water to be vaporized in a steam generator of a nuclear reactor having a feedwater circulatory loop, a feedwater tank connected in the feedwater circulatory loop, an electromagnetic filter having an inlet and an outlet directly connected to the feedwater circulatory loop, a first and a second line branching from the feedwater circulatory loop downstream of said electromagnetic filter in direction of feedwater flow therethrough, said first line being a rinsing line, rinse water pressure and temperature reducing means connected to said first rinsing line, and a waste water line connected to said rinse water reducing means, an ion exchange filter connected in said second line, means for reducing pressure and temperature connected in said second line



upstream of said ion exchange filter in feedwater flow direction through said line, a circulating pump connected in said feedwater circulatory loop upstream of said electromagnetic filter in said feedwater flow direction through said loop, and third line being a connecting line extending from said feedwater tank to a location of said feedwater circulatory loop between said circulating pump and said inlet of said electromagnetic filter, whereby during emergency operation of the reactor the electromagnetic filter may be periodically rinsed.

4,216,058

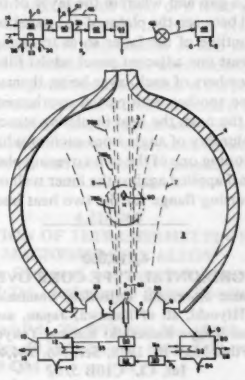
ENHANCED FISSION BREEDER REACTOR

Edward F. Marwick, 5149 W. Morse Ave., Skokie, Ill. 60076

Continuation-in-part of Ser. No. 810,894, Jun. 28, 1977, Pat. No. 4,121,971, which is a continuation-in-part of Ser. No. 544,178, Jan. 27, 1975, abandoned. This application Oct. 20, 1978, Ser. No. 953,166

Int. Cl.[2] G21C *1/00*

U.S. Cl. 176—39 **20 Claims**



1. A method of producing useful energy and isotopes, in a containing chamber having an impact point, utilizing a large mass of fissile and fertile actinides and a small mass of fissile and fertile actinides, each mass being less than critical, said method comprising the steps of:

injecting separately at two different predetermined times said large mass and said small mass respectively;

causing said large mass to move downwardly in said chamber toward said impact point;

propelling said smaller mass upwardly in said chamber to collide with said large mass such that the combined masses become more than prompt critical and produce a neutron pulse and intense nuclear reactions at said impact point;

substantially surrounding said center of nuclear reaction with a first region of slurry spray having a relatively dense actinide concentration of material to be irradiated; and

substantially surrounding said first region with a second region of slurry spray having a relatively lean actinide configuration of material to be irradiated.

4,216,059

PROTECTIVE DEVICE FOR A VESSEL SUSPENDED OF A NUCLEAR REACTOR

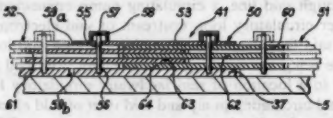
Guy Lemercier, Le Puy Sainte Reparade, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 27, 1978, Ser. No. 873,078

Claims priority, application France, Feb. 11, 1977, 77 03930

Int. Cl.[2] G21C *11/08*

U.S. Cl. 176—87 **7 Claims**



1. A protective device for a vessel suspended below a closing plate of a nuclear reactor in which in the area of its connection to the plate the vessel wall is covered towards the inside of the vessel by a metal heat insulating structure constituted by at least one layer of juxtaposed panels, each being formed by two parallel covering plates between which is arranged a layer of thin superimposed metal members, the connection between the covering plates being ensured by pins which are perpendicular to the plane of said plates fixed at one end to one of the plates and screwed at the opposite end onto a nut supported on the other plate whilst compressing the layer, wherein the edges of the covering plates of two adjacent panels in the structure are separated by a gap and wherein the layer of thin metal members mounted between the plates of one panel laterally projects beyond the outline of the latter so as to engage between the plates of at least one adjacent panel whilst filling the gap, the thin metal members of each layer being themselves staggered relative to one another with partial overlapping between one member and the next, the heat insulating structure being supported by a plurality of angle irons each of which has a lateral ferrule constituting one of the two covering plates of each heat insulating panel applied against the inner wall of the vessel and a lower supporting flange for the two heat insulating panels.

4,216,060

HORIZONTAL TYPE COKE OVENS

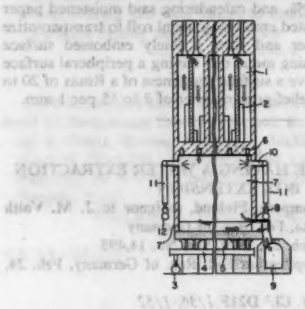
Hidemi Murata; Koretoshi Fujishiro; Shunsaku Hiraga, and Masamitu Hiyoshi, all of Kagawa, Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1978, Ser. No. 904,409

Int. Cl.[2] C10B *5/02*

U.S. Cl. 202—139 **5 Claims**

1. In a horizontal type coke oven in which gas generated in one of a plurality of vertically disposed heating flue chambers is discharged into one of a plurality of vertically disposed regenerator cells horizontally juxtaposed to said heating flue chambers, the improvement wherein there are provided nozzle openings for injecting ammonia or ammonia precursor into a flow passage of the waste gas from said heating flue chamber and at a top portion of said regenerator cell where the temperature of the waste gas is 750–1000° C. so as to reduce nitrogen



oxides in the waste gas with the ammonia or ammonia precursor.

4,216,061

SEALING ARRANGEMENT FOR COKE OVEN DOOR

Manfred Blase, Essen, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Fed. Rep. of Germany

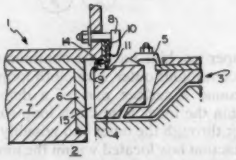
Continuation of Ser. No. 677,850, Apr. 16, 1976, abandoned.

This application Apr. 21, 1977, Ser. No. 789,717

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1975, 2517685

Int. Cl.[2] C10B *25/16*

U.S. Cl. 202—248 **5 Claims**



1. A coke oven door sealing arrangement comprising:

a door frame mounted within an oven chamber containing therein coal and generating therein high pressure gas during coking of the coil;

a coke oven door positionable in a closed position within said door frame with gaps between said door and said door frame;

inner sealing strip means, attached to said door, for contacting said door frame when said door is in said closed position to form an elastic and flexible inner seal allowing passage therethrough of said high pressure gas but preventing passage therethrough of said coal;

outer sealing strip means, attached to said door, for contacting said door when said door is in said closed position to form a nonflexible gas-tight outer seal preventing passage therethrough of said gas, said outer sealing strip means comprising a flat planar member extending substantially perpendicular to said door frame and having a vertically extending edge contacting said door frame;

said inner and outer sealing strip means, at areas thereof spaced from contact with said door frame, being in contact with each other and being attached to said coke oven door;

said inner and outer seals and said door frame defining therebetween a longitudinal guide duct into which passes said gas through said inner seal, said inner seal extending vertically upwardly and terminating at a position substantially above the upper level of the coal in said oven chamber,

said guide duct thereby being open at the upper end thereof;

said inner sealing strip means being formed of an elastic material and having an angular transverse cross-sectional configuration and a vertically extending edge contacting said door frame in such a manner that, upon an increase of the gas pressure within said oven chamber, said elastic inner sealing strip means is urged by such increased gas pressure against said door frame with increased force, thus reducing the amount of said gas entering said guide duct and thereby reducing the pressure within said guide duct acting on said outer sealing strip means; and

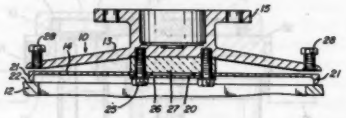
said guide duct being in gas flow communication with to risers and gas mains of the coke oven, maintained at a pressure lower than the gas pressure within said guide duct, for removing said gas from said guide duct, longitudinally thereof, during normal coking operation of said oven chamber.

4,216,062

SEALING MEANS FOR A COKE OVEN CHUCK DOOR

Calvin E. Kelly, Murrysville Borough, and Richard W. Stanley, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 5, 1979, Ser. No. 8,992
Int. Cl.[2] C10B *25/06*
U.S. Cl. 202—248 **6 Claims**



1. In a chuck door which includes a frame and a sealing member supported on said frame at the inside surface thereof, the improvement comprising:

means providing a cantilever support for said sealing member on said frame;

said sealing member being of metal which provides springiness and flexibility and having a knife edge extending around its perimeter and being removable from said frame for replacement.

4,216,063

PROCESS FOR RECOVERY OF TOLUENE DIISOCYANATE

Pierre Ailloud, Marcq eb Baroeul, and Philippe D'Haussy, Saint Andre, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jun. 23, 1978, Ser. No. 918,581
Claims priority, application France, Jul. 12, 1977, 77 21436
Int. Cl.[2] B01D *1/24*
U.S. Cl. 203—91 **7 Claims**

1. A process for the continuous separation of toluene diisocyanate, without decomposition thereof, from a crude residue mixture of reaction mass containing the toluene diisocyanate which comprises:

(a) continuously introducing the residue mixture into an agitated, scraped evaporator under a pressure of 1 to 50 mm Hg for a minimum residence time of 15 minutes;

(b) evaporating the toluene diisocyanate at an initial temperature between about 70° C. to about 175° C.;

(c) moving the residue mixture progressively along the wall of the evaporator to a temperature of about 210° C. to about 250° C.;

(d) condensing and collecting the evaporated toluene diisocyanate; and

(e) collecting the dry solid residue under vacuum.

4,216,064

METHOD OF ASSESSMENT OF THE EFFECT OF CURRENT PERIODICAL POLARITY INVERSION IN ELECTROCHEMICAL PROCESSES

Peter R. Penchev, and Stoyan S. Gishin, both of Sofia, Bulgaria, assignors to Komitet po Transportno Mashinostroene, Sofia, Bulgaria

Filed Jun. 4, 1979, Ser. No. 45,398
Claims priority, application Bulgaria, Jun. 6, 1978, 39984
Int. Cl.[2] C25D *13/00, 13/06*
U.S. Cl. 204—1 T **1 Claim**

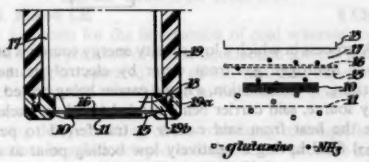
1. A method of assessment of the effect of the periodic inversion of D.C. current polarity in electrochemical processes, comprising reading and recording the variation of the shape and of the magnitude of the current, the variation of the voltage, the variation of the active internal resistance, and the variation of the electrode potentials during the forward and inverse current intervals and during the transitional regimes of current polarity inversion.

4,216,065

BIO-SELECTIVE ELECTRODE PROBES USING TISSUE SLICES

Garry A. Rechnitz; Mark A. Arnold, and Mark E. Meyerhoff, all of Newark, Del., assignors to University of Delaware, Newark, Del.

Filed Jun. 18, 1979, Ser. No. 49,092
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—1 T **6 Claims**



1. A bio-selective potentiometric electrode probe equipped with a gas-permeable membrane for the determination of the concentration of a preselected amino acid in an aqueous liquid comprising an ammonia gas analytical electrode provided at its tips with a closely adjacent thin layer of a fresh animal tissue containing, as a natural constituent thereof, a preselected enzyme effective to catalyze degradation of said amino acid in analysis to either ammonia or to an intermediate compound subject to further degradation to ammonia in the presence of an additional preselected enzyme, which ammonia is a function of said preselected amino acid concentration in said aqueous liquid, and a dialytic membrane interposed between said gas-permeable membrane and said animal tissue layer.

4,216,066

PREPARATION OF TETRAMETHYLTIN FROM A MAGNESIUM-TIN ALLOY

Ronald J. Allain, Richmond, and Joseph P. Maniscalco, Sugar Land, both of Tex., assignors to Nalco Chemical Co., Oak Brook, Ill.

Filed Feb. 26, 1979, Ser. No. 15,032
Int. Cl.[2] C25B *3/12*; C07F *7/22*
U.S. Cl. 204—59 QM **1 Claim**

1. A method of producing tetramethyltin which comprises the steps of:

(a) Reacting methylchloride in an ether solvent with a tin-magnesium alloy containing from 1:1 to 1:2 mole ratio of tin to magnesium whereby a substantial quantity of the methylchloride present in said ether solvent is converted to tetramethyltin and methyl magnesium chloride, forming thereby a resultant solution of tetramethyltin, methyl

magnesium chloride, methyl chloride, and the ether solvent, and then

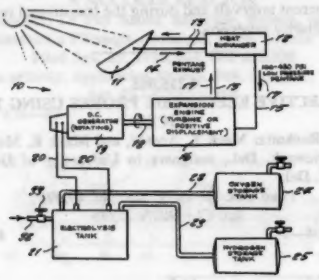
(b) electrolyzing said resultant solution containing, among its other components, methyl magnesium chloride in an electrolytic cell containing tin anodes whereby additional quantities of tetramethyltin are produced.

4,216,067

SOLAR ENERGY OPERATED HYDROGEN REFINING PROCESS

Glen Mitchell, 5840 Walerga Rd., #2, Sacramento, Calif. 95842

Filed Jul. 2, 1979, Ser. No. 54,011
Int. Cl.[2] C25B 1/04
U.S. Cl. 204—129 6 Claims



1. A process in which a low density energy source is used to produce hydrogen gas from water by electrolysis method, comprising, in combination, a liquid carrier being heated by an energy source, said carrier being carried to a heat exchanger where the heat from said carrier is transferred to pentane (C_5H_{12}) fluid having a relatively low boiling point at atmospheric pressure of 39 degrees C. or 102 degrees F., such pentane fluid circulating through an expansion engine coupled to a direct current generator providing power to positive and negative electrodes submerged in water of a tank, a hydrogen gas being produced by electrolysis at one electrode and oxygen gas being produced by electrolysis at another electrode, said gases then being collected therefrom in separate storage tanks; each said electrode having a spiral, loosely wound plate that is vibrated by a vibrator at an upper end of said electrode.

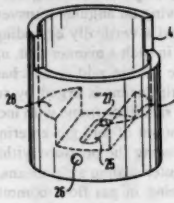
4,216,068

ION SENSITIVE ELECTRODE AND CELLS FOR USE THEREWITH

Johannes G. Schindler, and Werner Riemann, both of Marburg, Fed. Rep. of Germany, assignors to Dr. E. Fresenius Chemisch Pharmazeutische Industrie KG Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Division of Ser. No. 652,349, Jan. 26, 1976, Pat. No. 4,135,999.
This application Jun. 6, 1977, Ser. No. 803,541
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1975, 2503176
Int. Cl.[2] G01N 27/30, 27/46
U.S. Cl. 204—195 R 6 Claims

1. A single rod measuring cell comprising an electrode body having one flat surface, a reference electrode and a measuring electrode flush with said surface but spaced from each other by a small distance, and including a casing surrounding said electrode body defining a tub-shaped measuring chamber, delimited by said flat surface of said electrode body and by a flat inner wall opposite said flat surface disposed proximate one end of said casing, said measuring chamber further delimited by two narrow ends, said casing further including inflow and outflow channels being bored from the outside of said casing inwardly just below said inner wall of said casing, and ending



at said two narrow ends of said measuring chamber, said narrow ends just being cut thereby

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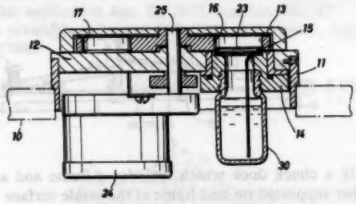
4,216,069

DETECTOR FOR TRACE LEAD IN GASOLINES

Don C. Olson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 908,292, May 22, 1978, Pat. No. 4,153,517.
This application Jan. 31, 1979, Ser. No. 8,016
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 R 5 Claims



1. An improved galvanic detector for measuring trace amounts of lead in gasoline, said detector comprising:

a frame member,

a turntable having at least one sample receiving means disposed on its surface, said turntable being rotatably mounted on said frame member and said sample receiving means comprising an opening formed in the surface of said turntable and adapted to receive and support a porous carrier medium which is capable of absorbing a sample of gasoline;

a galvanic cell, said galvanic cell being mounted on said frame member with its electrodes adjacent the path of said turntable; and,

a motor means coupled to said turntable to rotate said turntable so that said sample receiving means passes in close proximity to electrodes of said galvanic cell.

4,216,070

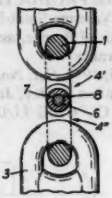
PROTECTION OF STUD-LINK CHAIN-CABLES BY MEANS OF SOLUBLE ANODES

Robert Debost, Jurancon, France, assignor to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Mar. 28, 1979, Ser. No. 24,689
Claims priority, application France, Mar. 29, 1978, 78 09035
Int. Cl.[2] C23F 13/00
U.S. Cl. 204—197 5 Claims

1. A cathodically protected anchor chain having a plurality of links, each link having an inner circumference, at least one stud extending between opposite points on the inner circumference of at least one of said links, said one stud being located

entirely within the outer circumference of said one link so as to avoid damage to the stud and facilitate handling of the chain,



at least an outer layer of said stud being constructed of anodic material.

4,216,071

ELECTRODEPOSITION CELL

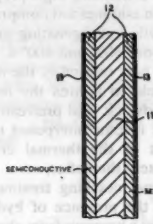
Heinrich F. H. Gobrecht, Berlin, Fed. Rep. of Germany, assignor to Energietechnik GmbH Studiengesellschaft für Energie-Umwandlung- , -Fortleitung und -Anwendung, Kettwig, Fed. Rep. of Germany

Filed Mar. 2, 1978, Ser. No. 882,940

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709385

Int. Cl.² C25B *11/00, 11/06*

U.S. Cl. 204—242 **9 Claims**



4. An electrolytic cell for the release of a substance from an electrolyte at an electrode, comprising an anode and a cathode in contact with an electrolyte and connectible respectively with positive and negative terminals of a current source, said anode and said cathode constituting electrodes, at least one of said electrodes being provided with at least a layer of a semiconductive material in regions of said one of said electrodes in contact with said electrolyte, said semiconductive material being a p-type semiconductor in the case of said anode and an n-type semiconductor in the case of said cathode, said one of said electrodes comprising a support, said semiconductive material being formed as a layer on said support with a thickness of 0.2 to 2 mm, said semiconductive layer being an oxide or sulfide of the metal of said support.

4,216,072

DIAPHRAGMS FOR USE IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Igor V. Kadija, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 836,636, Sep. 26, 1977, Pat. No. 4,184,939, and Ser. No. 838,600, Oct. 3, 1977, Pat. No 4,165,271. This application Nov. 10, 1977, Ser. No. 850,187

Int. Cl.² C25B *13/04, 1/34*

U.S. Cl. 204—252 **45 Claims**

1. A porous diaphragm for an electrolytic cell for the electrolysis of alkali metal chloride brines which comprises a support fabric of thermoplastic materials impregnated with a mixture comprising glass fibers and a non-fibrous component containing silica.

4,216,073

ION EXCHANGE RESIN CONTAINING ACTIVATED CARBON

Arthur L. Goldstein, Weston, Mass., assignor to Ionics Inc., Watertown, Mass.

Filed May 29, 1979, Ser. No. 42,753

Int. Cl.² C25B *13/08*

U.S. Cl. 204—296 **12 Claims**

1. An ion-exchange resin of a synthetic, cross-linked, substantially insoluble polymer, the improvement comprising activated carbon particles contained or imbedded within said ion-exchange polymer.

4. The ion-exchange resin of claim 1 having a structure in a sheet or membrane form and having at least two dimensions in excess of one centimeter.

11. An electrochemical apparatus comprising chambers adapted to contain liquid defined by ion-permeable membranes and having terminal electrodes for passing a direct current transversely through said chambers and membranes, the improvement wherein at least some of said membranes are comprised of a cross-linked, ion-exchange polymer with said polymer having imbedded therein finely divided particles of activated carbon.

4,216,074

DUAL DELAYED COKING OF COAL LIQUEFACTION PRODUCT

Andre A. Simone, Denville, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Aug. 30, 1978, Ser. No. 938,222

Int. Cl.² C10G *1/00, 1/06, 9/14*

U.S. Cl. 208—8 LE **8 Claims**

1. In a process for the liquefaction of coal wherein coal is liquefied in the presence of a coal liquefaction solvent and the liquefied coal is separated into an ash free coal liquefaction product and an ash containing coal liquefaction product, the improvement comprising:

effecting delayed coking of ash containing coal liquefaction product in a first delayed coking zone to produce an ash containing coke and a first vapor;

effecting delayed coking of ash free coal liquefaction product in a second delayed coking zone to produce an ash free coke and a second vapor;

condensing from the first vapor a first liquid recycle, said first liquid recycle containing ash;

introducing said first liquid recycle into the first delayed coking zone;

introducing first vapor remaining after condensing of said first liquid recycle into a main combination fractionator wherein there is recovered a second liquid recycle, said second liquid recycle being free of ash, a coal liquefaction solvent and lighter components;

passing second liquid recycle to the second delayed coking zone; and

passing coal liquefaction solvent to the liquefaction of coal.

4,216,075

COMBINATION DEWAXING PROCESS

Douglas G. Ryan, 145 Andrea Dr., Rockaway, N.J. 07866

Filed Dec. 28, 1978, Ser. No. 974,070

Int. Cl.² C10G *43/08*

U.S. Cl. 208—35 **17 Claims**

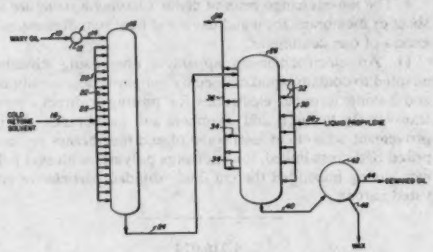
1. A continuous, combination non-autorefrigerant/autorefrigerant solvent dewaxing process for dewaxing waxy hydrocarbon oils which comprises the steps of:

(a) passing the waxy oil into a first chilling zone wherein a portion of the wax is precipitated from the oil by cooling same in the presence of a non-autorefrigerant dewaxing solvent to form a slurry comprising an oil solvent mixture and solid particles of wax;

(b) passing said slurry from said first chilling zone to a second chilling zone which comprises a vertical, multi-staged

tower operating at a constant pressure wherein each stage contains a liquid space and a vapor space above the liquid space, each of said vapor spaces also containing means for removal of autorefrigerant vapor therefrom;

(c) cooling said slurry produced in said first chilling zone down to wax filtration temperature and precipitating additional wax therefrom in said second chilling zone by contacting same in said second zone with a liquid autorefrigerant which is introduced under flow rate control conditions into a plurality of the stages in said second zone and allowed to evaporate therein so as to achieve an



average cooling rate of the slurry in said zone ranging from between about 0.1° to 20° F. per minute with an average temperature drop across each stage into which said liquid autorefrigerant is introduced and evaporated ranging from between about 2° to 20° F. and wherein the evaporated autorefrigerant is removed from each of said stages into which said liquid autorefrigerant was injected in a manner such that the autorefrigerant vapor formed in any given stage does not pass through all of the stages in the tower above said stage; and

(d) separating the wax from the slurry to obtain wax and a dewaxed oil solution.

4,216,076

ANTIFOULANT ADDITIVES FOR HYDROCARBON STREAMS

Edward T. Dillon, Pasadena, and Lloyd W. Duncan, Big Spring, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 857,505, Dec. 5, 1977. This application Jul. 16, 1979, Ser. No. 58,126

Int. Cl.[2] C10G *9/16*; C09K *15/12*; C23F *14/02*

U.S. Cl. 208—48 AA **17 Claims**

1. A method for preventing fouling of equipment used in hydrocarbon processing which comprises adding to said hydrocarbon an antifouling agent represented by the formula;

$$\left[R-(OCH-CH_2)_n SO_x \right]^- M^+$$

(with R_1 on the CH)

wherein R is a linear alkyl radical having from about 6 to 15 carbon atoms or an alkyl phenyl radical wherein the alkyl group contains from about 8 to 10 carbon atoms, R_1 is H or CH, n is a number from 3 to 8, x is 3 or 4 and M^+ is an ammonium or an alkali metal cation.

4,216,077

METHOD OF CRACKING UNDER HYDROGEN PRESSURE FOR THE PRODUCTION OF OLEFINS

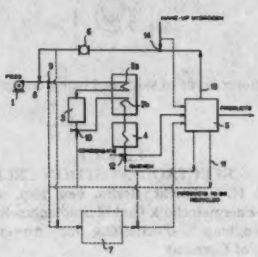
Edgar Chahvekilian, La Varenne Saint-Hilaire, and Rene Brouard, L'Isle-Adam, both of France, assignors to CECA S.A., Velizy-Villacoublay, France

Filed Jul. 5, 1978, Ser. No. 921,909

Claims priority, application France, Jul. 5, 1977, 77 20637

Int. Cl.[2] C10G *13/00*

U.S. Cl. 208—57 **5 Claims**



1. A continuous process whereby a hydrocarbon feedstock is subjected to thermal cracking under pressure and in the presence of hydrogen to convert said feedstock to products of lower molecular weight containing high proportions of olefinic components, wherein said method comprises the steps of:

(a) conducting a catalytic hydrogenating pretreatment at a temperature from about 300° and 600° C. and a pressure from about 12 to 85 bars to modify the molecular structures of the feedstock, to lighten the feedstock and to desulphurize said feedstock, said pretreatment being conducted in a catalytic reactor interposed in a preheating-/vaporization circuit of the thermal cracking process proper; and immediately thereafter;

(b) conducting a thermal cracking treatment of the pretreated feedstock in the presence of hydrogen and the absence of steam under a pressure from about 10 to 70 bars with a residence time of less than 0.5 second and at a temperature from about 625° C. to 1,000° C., the quantity of hydrogen employed being such that its molar concentration in the effluents is at least equal to 20%.

4,216,078

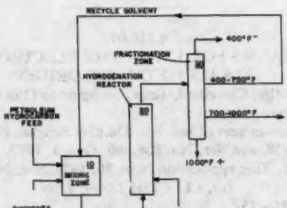
HYDROGENATION OF PETROLEUM LIQUIDS USING QUINONE CATALYSTS

Karl W. Plumlee, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 17, 1976, Ser. No. 686,828

Int. Cl.[2] C10G *23/02*

U.S. Cl. 208—143 **25 Claims**



1. A process for hydrotreating a petroleum hydrocarbon feed comprising admixing with said hydrocarbon feed an

added quinone compound, and hydrogenating said admixture at temperature ranging from about 500° F. to about 1050° F.

4,216,079

EMULSION BREAKING WITH SURFACTANT RECOVERY

Jack Newcombe, Tulsa, Okla., assignor to Cities Service Company, Tulsa, Okla.

Filed Jul. 9, 1979, Ser. No. 55,845
Int. Cl.² C10G *33/04*
U.S. Cl. 208—188 **13 Claims**

1. In a process for recovering crude oil, water, and surface active agents from an oil-in-water emulsion recovered from an oil reservoir, the improvement comprising

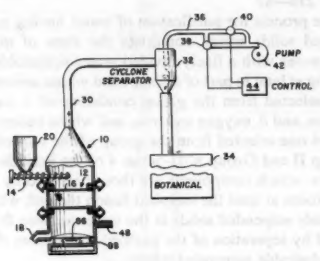
adding sufficient brine and partitioning agent to form three phases, an oil phase containing a minor amount of said surface active agents, a partitioning agent phase containing the majority of said surface active agents, and a brine phase containing a minor amount of said surface active agents.

4,216,080

METHOD AND APPARATUS FOR SEPARATING SAND FROM BOTANICAL FINES

Thomas W. Summers, Fern Creek, and Earl E. Kohnhorst, Louisville, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 623,886, Oct. 20, 1975, abandoned.
This application Jan. 29, 1979, Ser. No. 7,109
Int. Cl.² B03B *4/00*
U.S. Cl. 209—469 **23 Claims**



1. A method of separating the components of a mixture of sand and botanical fines comprising:

(a) constraining a plurality of particles as a close-packed array between a pair of spaced horizontal porous retaining members within an enclosed chamber;

(b) introducing said mixture into said chamber above the upper porous retaining member of said pair;

(c) vibrating said particles;

(d) passing a stream of gas upwardly through said array;

(e) removing botanical fines from said chamber above said array;

(f) removing sand from said chamber beneath said array; and,

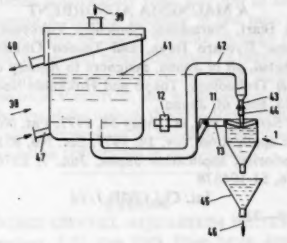
(g) adjusting the packing density of said particles in response to a change in the proportion of sand to botanical fines by changing the spacing between said spaced horizontal porous retaining members during operation to alter the gaseous flow paths through said array and prevent the passage of botanical fines through said array while allowing sand to pass therethrough.

4,216,081

METHOD AND ARRANGEMENT FOR CONTINUOUS REGULATION OF THE SPECIFIC SLIME GRAVITY OR SLIME CONCENTRATION IN SETTLING CHAMBERS

Helmut F. Trawinski, Hirschau, Fed. Rep. of Germany, assignor to Amberger Kaolinwerke GmbH Co., Fed. Rep. of Germany

Continuation of Ser. No. 797,916, May 18, 1977, abandoned.
This application Sep. 19, 1978, Ser. No. 943,800
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1977, 2622988
Int. Cl.² B03B *11/00*
U.S. Cl. 209—496 **6 Claims**



1. A method for continuously-regulating the slurry-weight/-slurry-concentration of the discharge of a means for wet-mechanical separation of solids from suspensions of solids comprising the steps of:

A. measuring the viscosity of discharged slurry formed from separated solids by weighing the non-overflowing filling level outside of the separating means, and

B. altering the cross-sectional opening of a discharge member from which the slurry is discharged either by increasing or decreasing the discharge cross-section so that the slurry viscosity and accordingly the slurry-weight is retained constant and at an approximately adjusted value.

4,216,082

METHOD FOR PROCESSING A SLURRY OF COAL PARTICLES IN WATER

Eke Verschuur, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1977, Ser. No. 827,195
Claims priority, application United Kingdom, Jan. 7, 1977, 577/77
Int. Cl.² B03B *7/00*
U.S. Cl. 209—10 **1 Claim**

1. A process for preparing a statically stable coal slurry, suitable for use, storage or transport by ship, from a dynamically stable coal slurry, suitable for pipeline transport, comprising, dividing the dynamically stable slurry into at least two fractions by substantially extracting coarser coal particles larger than 0.1 mm together with a relatively small quantity of water from finer coal particles smaller than 0.1 mm with a relatively large quantity of water, and increasing the ratio of coal particles to water in the fine fraction by dewatering part of the fine fraction and mixing the dewatered part with the remaining part of the fine fraction.

4,216,083

PROCESS FOR COMPLETE OR SELECTIVE REMOVAL OF SALTS FROM AQUEOUS SOLUTION

Johannes Dale, Stasjonsveien 63, 1310 Blommenholm, and Gerd Borgen, Grinda 4, Oslo 8, both of Norway

Filed Sep. 19, 1978, Ser. No. 944,064
Claims priority, application Norway, Sep. 19, 1977, 773215
Int. Cl.² B01D *15/06, 15/08*
U.S. Cl. 210—31 R **6 Claims**

1. A process for complete, partial or selective removal of a

salt from an aqueous solution containing the salt, which comprises (1) contacting the aqueous solution with active carbon impregnated with a cyclic or linear polyether, said impregnation having been carried out by contacting the carbon with an aqueous solution of the polyether, and (2) successively eluting the polyether and the salt from the carbon, using a non-polar or slightly polar water-immiscible organic solvent to elute the polyether, and water to elute the salt.

4,216,084

METHOD FOR TREATING WASTE WATER CONTAINING ORGANIC CONTAMINANTS UTILIZING A MAGNESIA ADSORBENT

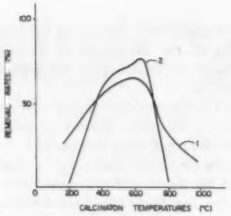
Yoshikatsu Ikari, Narashino; Shoichiro Yokoyama, Musashi-Murayama; Ryutaro Itaya, and Tsuneo Ohkuma, both of Norboribetsu, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo and Hokkaido Soda Co., Ltd., Hokkaido, both of, Japan

Division of Ser. No. 802,117, May 31, 1977, Pat. No. 4,147,665. This application Nov. 14, 1977, Ser. No. 851,178

Claims priority, application Japan, Jun. 7, 1976, 51-66214; Sep. 1, 1976, 51-104578

Int. Cl.[2] C02B *1/14*

U.S. Cl. 210—32 **8 Claims**



1. A method of treating waste water which contains organic contaminants comprising contacting the waste water with an adsorbent which comprises a mixture of (1) magnesia obtained by thermal decomposition at 500°–700° C. of a heat-decomposable magnesia-producing compound, and (2) 5–40% by weight based on the total weight of the adsorbent of a metal oxide selected from the group consisting of alumina, ferric oxide, calcium oxide and kaolin, said adsorbent being used in an amount by weight equivalent to 5–20 times the COD value of said waste water, and the pH of said waste water being in the range of 6.5 to 8.5.

4,216,085

FLOTATION METHOD AND APPARATUS

Jimmie A. Chittenden, Amarillo, Tex., assignor to Iowa Beef Processors, Inc., Dakota City, Nebr.

Filed Aug. 18, 1978, Ser. No. 934,932

Int. Cl.[2] B03D *1/24*

U.S. Cl. 210—44 **20 Claims**

1. Apparatus for removing contaminants from wastewater, comprising,

a flotation chamber,

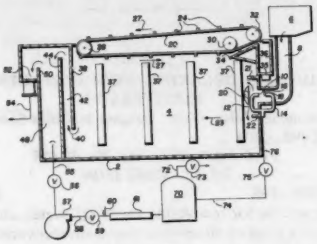
inlet means for introducing wastewater into the flotation chamber, said inlet means including walls for enclosing a stream of wastewater moving in an axial flow path,

effluent discharge means for discharging clarified liquid from the flotation chamber at a location spaced from said inlet means,

means for producing a gas-containing liquid,

supply means for introducing said gas-containing liquid into the wastewater,

said supply means have a pair of discharge openings located in the inlet means and surrounded by the wall of the inlet means, said discharge openings being in spaced opposed mutually confronting relationship whereby streams of gas-containing liquid emerging therefrom collide to create



an area of high turbulence and produce an intimate mix of gas-containing liquid and wastewater.

4,216,086

PROCESS FOR CLARIFYING WATER

John L. Lang, P.O. Box 1242, Midland, Mich. 48640

Continuation-in-part of Ser. No. 716,658, Aug. 23, 1976, abandoned, which is a continuation-in-part of Ser. No. 539,031, Jan. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 228,336, Feb. 22, 1976, Pat. No. 3,909,406, which is a continuation-in-part of Ser. No. 144,416, May 17, 1971, abandoned. This application May 27, 1977, Ser. No. 801,323

The portion of the term of this patent subsequent to Sep. 30, 1992, has been disclaimed.

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—47 **6 Claims**

1. The process for purification of water having undesirable suspended solids which comprises the steps of mixing said impure water with a finely-divided water-hydratable material consisting at least in part of a compound whose anionic component is selected from the group consisting of: i. oxygen and aluminum, and ii. oxygen and iron, and whose cationic portion is at least one selected from the group of the ions of elements of Group II and Group VIII-Series 4 of the Periodic Table of Elements, which compounds are those prepared by a process which attains at least the incipient fusion thereof; whereby the undesirable suspended solids in the water become flocculated, followed by separation of the purified water from the flocculated undesirable suspended solids.

4,216,087

SCRUBBER SCALE PREVENTION

Ray S. Long, Walnut Creek, and John B. Siemak, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 18, 1978, Ser. No. 970,707

Int. Cl.[2] C02G *5/06*

U.S. Cl. 210—58 **12 Claims**

1. A method of controlling calcium scaling in scrubbers used to remove SO_2 from flue gases which comprises contacting, in a scrubber, said flue gas with an aqueous stream containing calcium and comprising an amount of a concentrated sodium hydroxide solution sufficient to maintain the pH of said stream between about 5.5 and about 7.5 and an amount of a 2-hydroxyethyl iminodiacetate calcium inhibitor sufficient to control calcium scaling in said scrubber.

4,216,088
METHOD OF TREATING PHENOLIC WATERS FORMED IN THE MANUFACTURE OF PHENOL-FORMALDEHYDE RESINS

Anatoly M. Juferov, ulitsa Tukhachevskogo, 34, kv. 112; Galina I. Shakhova, bulvar Stroitelei, 1a, kv. 67, and Olga M. Nesterova, Vostochny prospekt, 15b, kv. 28, Ala.L OF KEMEROVO U.S.S.R.

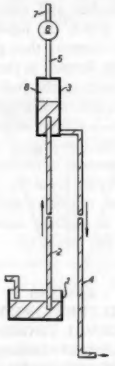
Filed Nov. 13, 1978, Ser. No. 959,424
Claims priority, application U.S.S.R., Dec. 26, 1977, 2560372
Int. Cl.² C02C *5/02*
U.S. Cl. 210—59 **7 Claims**

1. A method of treatment of phenolic waters containing 2–5 weight percent phenol, and 3–5 weight percent formaldehyde, and having been formed in the manufacture of phenol-formaldehyde resins, comprising: mixing said phenolic waters with formaldehyde taken in the quantity of 5–9 parts by weight per 100 parts by weight of phenolic waters and the product of phenol-formaldehyde condensation, taken in the quantity of 15–25 parts by weight per 100 parts by weight of phenolic waters, and heating the mixture in the presence of alkali to a temperature of 60°–85° C. for a sufficient period of time to obtain a resulting solution having a substantially reduced phenol and formaldehyde content.

4,216,089
WASTE WATER TREATMENT

Arthur G. Boon, and Harold R. S. Page, both of Stevenage, England, assignors to Water Research Centre, England

Filed May 17, 1978, Ser. No. 906,449
Claims priority, application United Kingdom, May 19, 1977, 21190/77
Int. Cl.² C02B *1/34*; B01D *47/06*
U.S. Cl. 210—63 R **10 Claims**



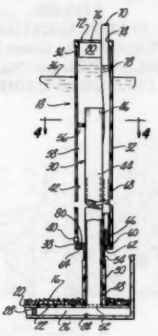
1. In a method for treating an aqueous liquid in which the liquid is subjected to a reduced pressure to remove dissolved and entrained undesirable gases therefrom, and a particular gas is then dissolved in the liquid, the improvement which comprises establishing siphonic flow in said liquid from a first level in a first container to a second lower level in a second container through a self-perpetuating siphon, thereby subjecting said liquid to reduced pressure, whereby gases dissolved and entrained in said liquid are released therefrom, the liquid flowing in said siphon upwardly in a first conduit from said first container to the top of the siphon and then downwardly in a second conduit to said second container; withdrawing said released gases from the top of the siphon, thereby preventing said gases from being carried downward by liquid flowing in said second conduit and from being redissolved in said liquid; and maintaining a reduced pressure at the top of said siphon to continue to release said gases at the top of said siphon to maintain the liquid flow through the siphon.

4. In a method of oxygenating waste water or aqueous sludge for the oxidative treatment thereof, wherein an oxygen-containing gas is dissolved in the waste water or sludge and the so-treated water or sludge is thereafter subjected to oxidation, and wherein dissolved or entrained gases are removed from the waste water or sludge, prior to dissolving the oxygen therein, by subjecting the waste or sludge to a reduced pressure to cause gases entrained or dissolved therein to be released therefrom, the improvement which comprises passing the waste water or sludge from a first level through a siphon to a second lower level, the siphon comprising an upstanding inverted U-shaped tube a first arm of which extends vertically upwards from said first level to the top of the siphon and the second arm of which extends downwardly from said top to said second level; maintaining a reduced pressure in the tube at a third level, the waste water or sludge flowing through the siphon under siphonic forces and being subjected to reduced pressure therein, whereby gases dissolved or entrained therein are released and removed therefrom; and withdrawing said released gases from the top of the siphon, thereby preventing said gases from being carried downward by liquid flowing in said second arm and from being redissolved in said liquid.

4,216,090
UNDER GRAVEL AQUARIUM FILTER

Denzel J. Dockery, P.O. Box 7048, Flint, Mich. 48507

Filed Aug. 14, 1978, Ser. No. 933,472
Int. Cl.² A01K *63/00*
U.S. Cl. 210—169 **9 Claims**



1. A circulating system for an aquarium having water and a material such as gravel on the bottom of the aquarium, said system comprising:

a grid disposed upwardly from the bottom of the aquarium to form a chamber between the bottom of the aquarium and the underside of said grid, said material being disposed on said grid;

said chamber communicating with the water in said aquarium through said grid and through said material;

means for pumping the water in said aquarium from a point above said grid and into said chamber, said pumping means further comprising:

an elongated tubular housing having a first end positioned below the waterline of the aquarium and a second end positioned above the waterline of the aquarium, said housing including at least one port near its first end for establishing fluid communication between said aquarium water and the interior of the housing;

conduit means extending longitudinally through a portion of the interior of said housing, said conduit means being open at its lower end to said chamber and open at its upper end to the interior of said housing; and

means for raising water from the bottom of said housing to above the upper end of the conduit means and also above the waterline of the aquarium whereby water flows down-

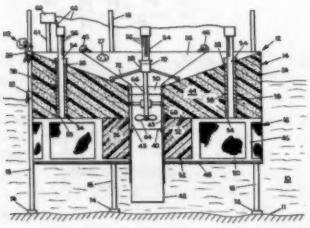
wardly through said conduit means and into said chamber, said raising means further comprising an air pump having a compressed air outlet and means for fluidly connecting said compressed air outlet to the interior of said housing at its lower end, said conduit means extending substantially coaxially through said housing, said conduit means being spaced inwardly from said housing and forming an annular pump chamber therebetween and said raising means further comprising means for raising water from the bottom of said annular pump chamber to above the open upper end of the conduit means, said fluid connecting means further comprising an air nozzle having an inlet and at least one outlet, said air nozzle being positioned within the interior of said housing and at the lower end of the annular chamber, an air tube for connecting the air pump outlet to the air nozzle inlet and said air nozzle outlet being open to said annular chamber, said housing including a reduced diameter neck portion which engages said conduit means and said air nozzle being annular in shape and spaced upwardly from said reduced diameter neck portion thereby forming a nozzle chamber therebetween, said nozzle inlet being open to said nozzle chamber, and said nozzle outlet further comprising a plurality of spaced bores through said nozzle, each bore being open at one end to said nozzle chamber and at its outer end to said annular pump chamber.

4,216,091

WATER AERATOR

Paul J. Mineau, 825 S. Baird St., Green Bay, Wis. 54301

Filed Jul. 10, 1978, Ser. No. 923,460
Int. Cl.[2] C02B *3/08*; B01F *3/04*
U.S. Cl. 210—175 **18 Claims**



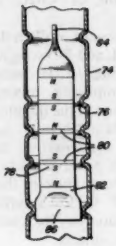
1. An aerator for bodies of water comprising in combination:
a housing having sides, a bottom wall with a central opening and a generally horizontal concave top wall with a central opening;
a core of buoyant material at least in the upper portion of the housing, the core having a vertical central bore therethrough;
the top wall of the housing being above the core of buoyant material and sloping downwardly to the central opening;
the core of buoyant material being sufficient to maintain the top wall above the surface of the body of water in which the aerator is placed;
a conduit extending down from the central opening in the top wall through the core and through the bottom wall beneath the housing;
a plurality of aerator pump means mounted in the housing spaced from and about the central opening in the top wall, each of the aerator pump means having means to draw water from beneath the core and to spray the water through the air above the top wall so that it is deposited thereon and flows to the central opening therein; and
means to disperse the aerated water in the conduit below the housing.

4,216,092

COAXIAL HYDROMAGNETIC DEVICE FOR HYDRAULIC CIRCUITS CONTAINING CALCIUM AND MAGNESIUM IONS

William N. Shalhoob, Santa Ynez; Carl W. Chenchick, Santa Monica, and Alfred F. Kaspaul, Malibu, all of Calif., assignors to Hydromagnetics, Inc., Solvang, Calif.

Filed Jul. 24, 1978, Ser. No. 927,034
Int. Cl.[2] B03C *1/14*
U.S. Cl. 210—222 **10 Claims**



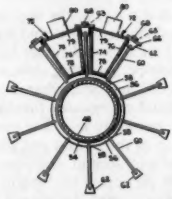
1. In an apparatus for inhibiting the formation of scale on surfaces which contact liquids, the apparatus including a conduit member through which a liquid flows, the improvement comprising:
a plurality of magnetic members arranged in series and carried by the conduit member, adjacent magnetic poles of the magnetic members being of like polarity, each pair of adjacent magnetic poles generating a region of maximum effective magnetic field intensity within the interior of the conduit member and radially proximous to the adjacent magnetic poles, the liquid passing through the region of magnetic intensity thus generated; and,
an annular constriction formed in the conduit member radially outwardly of each of the regions of maximum magnetic field intensity, the constriction effectively lying in a plane essentially coincidental with the loci of maximum magnetic flux within the region of maximum magnetic field intensity, the annular constriction acting to constrict liquid flow to thereby increase the velocity of the liquid in the radially adjacent region of maximum magnetic field intensity, thereby to initiate auto-nucleation of scale within the body of the liquid.

4,216,093

FABRICATED DISC FILTER CORE WITH PIPE HAVING A MAXIMIZED INTERNAL CROSS-SECTIONAL AREA

Alfred J. Kane, deceased, late of Munising, Mich., and by Helen Kane, executrix, 1470 Washington St., Munising, Mich. 49862

Filed Jun. 3, 1977, Ser. No. 803,204
Int. Cl.[2] B01D *33/26*
U.S. Cl. 210—247 **18 Claims**



1. In a filter disc assembly for use in conjunction with a tank containing a slurry, radiating segmented filter discs supported by a central elongated core, means for rotatably mounting the core along its longitudinal axis above the tank such that when

the core rotates, each segment of the filter disc alternately enters and withdraws from the tank, passages along the longitudinal length of the core, each filter disc segment having a hollow interior in fluid communication with one of the passages of the core, a vacuum means operably connected to the passages at selected rotational positions of the core to draw slurry filtrate through the filter disc segments and through the passages, the improvement in the rotatable central core comprising:

an elongated frame;

each of the passages being formed by at least one removable pipe section having a trapezoidal cross-section with radially disposed side walls for maximizing the flow of liquid through the passages;

a plurality of radially extending plates which have a plane in common with the central axis of the central core, the plates being substantially radially coextensive with the pipe segments and the pipe segments substantially filling the space between the radially extending plates; and

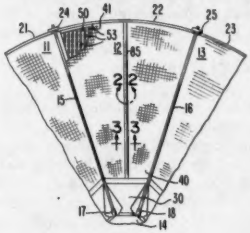
clips rotatably mounted on top of the plates, wherein said clips include a flange portion which seats against the pipe segments to secure said pipe segments in one rotational position, and which releases the pipe segments in a second rotational position, the clips thereby releasably and replaceably secured each pipe segment circumferentially about the elongated frame such that the pipe segments are replaceable and new pipe segments are secured by the rotatable clips.

4,216,094

SECTOR BODY FOR ROTARY DISC DEWATERING APPARATUS

Dallas H. Solum, Salt Lake City, Utah, assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Mar. 20, 1979, Ser. No. 22,236
Int. Cl.² B01D *39/00*
U.S. Cl. 210—331 **12 Claims**



1. An apparatus for dewatering a slurry, said apparatus comprising a filter disc mounted on an elongate center barrel for rotation about the axis of said center barrel, said disc comprising a plurality of sector assemblies, each sector assembly having side portions extending radially outward from the axis of said center barrel, each sector assembly comprising a sector body and a bell member, said sector body comprising two panels, said panels being generally parallel to and spaced apart from each other to define an interior space therebetween, at least one of said panels being perforated to enable liquid flow into said interior space, said perforated panel being covered by a filter medium, vacuum means being provided to draw liquid from said slurry through said filter medium via perforations in said perforated panel into said interior space for passage to said bell member and thence to said center barrel, a filter medium gathering means being provided on an exterior surface of at least one of said panels, said gathering means including a groove on said exterior surface, said groove extending radially with respect to the axis of said center barrel, a portion of said filter medium overlying said groove, said overlying portion of said filter medium being retained in said groove by a caulking material, said groove being located sufficiently inward from said side portions of said sector assembly so as to remove slackness from and reduce billowing of said filter medium.

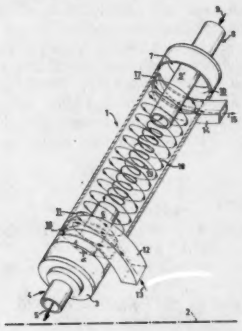
10. A sector body for use in a rotary filter disc dewatering apparatus, said sector body comprising two panels, said panels being generally parallel to and spaced apart from each other to define an interior space therebetween, each of said panels having side portions that extend from a narrow end to a wide end so as to provide a generally wedge-shaped configuration for said sector body, at least one of said panels being perforated to enable liquid flow into said interior space, said perforated panel being covered by a filter medium so that liquid from a slurry can be drawn through said filter medium via perforations in said perforated panel into said interior space, a filter medium gathering means being provided on an exterior surface of at least one of said perforated panels, said gathering means including a groove on said exterior surface, said groove extending radially with respect to the axis of rotation of the rotary filter disc of said dewatering apparatus, a portion of said filter medium overlying said groove, said overlying portion of said filter medium being retained in said groove by a caulking material, said groove being located sufficiently inward from said side portions of said sector assembly so as to remove slackness from and reduce billowing of said filter medium.

4,216,095

DYNAMIC DENSE MEDIA SEPARATOR

Henry J. Ruff, Southampton, United Kingdom, assignor to Sala International AB, Sala, Sweden

Continuation of Ser. No. 843,207, Oct. 18, 1977, abandoned.
This application Mar. 12, 1979, Ser. No. 19,583
Claims priority, application Sweden, Oct. 20, 1976, 7611644
Int. Cl.² B04C *3/06*
U.S. Cl. 210—512 R **4 Claims**



1. In a dynamic dense media separator comprising a cylindrical separation vessel having an axial outlet for separated material fractions of a lower density, at one end of said vessel, an inlet for dense media on the cylindrical surface of the separation vessel at the same end thereof as said outlet, and an axial inlet for material to be separated, at the opposite end of said separation vessel, and an outlet on the cylindrical surface of said separation vessel at the same end thereof as said material inlet for separated material fractions of higher density together with dense media; the improvement in which said outlet for separated material fractions of higher density together with dense media and said inlet for dense media both have the shape of an involute connection piece which at least partially surrounds the separation vessel and is bent substantially in the direction of the circumference of the vessel and has an outer wall whose radius of curvature progressively increases in the direction of travel of said separated material fractions of the higher density that exit together with dense media, said involute connection piece having an opening in the wall of the

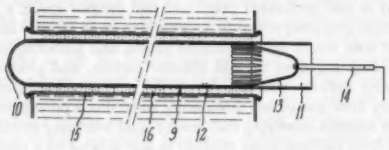
separation vessel which occupies about 90° of the circumference of the vessel.

4,216,096

OZONE GENERATION DEVICE AND ELECTRODE

Maurice Paré, Chambourcy, and Christian Coste, Versailles, both of France, assignors to Degremont, France

Filed Sep. 8, 1978, Ser. No. 940,616
Claims priority, application France, Oct. 18, 1977, 77 31248
Int. Cl.[2] C01B *13/12*; C25B *11/02*; B01K *1/00*
U.S. Cl. 250—539 12 Claims



1. An ozone generation device comprising:

an outer tubular electrode adapted to be connected to a first terminal of a high voltage AC source;

a dielectric tube positioned within said outer tubular electrode and spaced therefrom to form a discharge gap, said dielectric tube having a closed first end and an open second end;

an electrically conductive layer covering a major portion of the inner surface of said dielectric tube;

an electrically conductive cap positioned in contact with said layer adjacent said open second end of said dielectric tube, said cap having a partial spherical portion and a conical portion extending from said partial spherical portion, said partial spherical portion having a closed, substantially continuous and uninterrupted concave surface facing the interior of said dielectric tube; and

means for connecting said partial spherical portion to a second terminal of the high voltage AC source, such that said cap and said layer form an inner electrode, and when a voltage is applied between said inner and outer electrodes, an oxygen containing gas circulated through said discharge gap is transformed into ozone by silent discharge.

4,216,097

WATERFLOODING EMPLOYING AMPHOTERIC SURFACTANTS

Stamoulis Stournas, Flemington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 15, 1977, Ser. No. 815,740
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D 29 Claims

1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems in which an aqueous liquid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system at least 0.5 pore volume of an aqueous liquid containing a water-soluble amphoteric surfactant characterized by the formula:

$$R_1-{}^{+}\underset{\displaystyle R_3}{\overset{\displaystyle R_2}{N}}-R_4A^-$$

wherein:

R_1 is a hydrocarbyl group containing from 8 to 26 carbon atoms,

R_2 and R_3 are each independently a hydrocarbyl group containing from 1 to 8 carbon atoms or an alkoxy group containing from 2 to 10 carbon atoms and having a ratio of carbon atoms to oxygen atoms within the range of 2 to 3,

R_4 is an aliphatic group containing from 1 to 6 carbon atoms, and

A is a sulfonate group or a carboxylate group, in a concentration within the range of 0.005 to 0.05 weight percent.

4,216,098

SECONDARY RECOVERY PROCESS

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Jun. 19, 1978, Ser. No. 917,052
Int. Cl.[2] E21B *43/22*
U.S. Cl. 252—8.55 D 10 Claims

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

(A) injecting into the formation via an injection well a drive fluid comprising water having dissolved therein about 0.01 to about 5.0 weight percent of a water-soluble polymer consisting of repeating units of vinyl sulfonic acid alkoxylated with about 2 to 100 weight percent of a material selected from the group consisting of (I) ethylene oxide and (II) a mixture of ethylene oxide and propylene oxide,

(B) forcing the said fluid through the formation, and

(C) recovering hydrocarbons through the production well, and wherein the number average molecular weight of the said water-soluble polymer is about 10,000 to about 2,000,000.

4,216,099

BRIDGED PHENOL METAL SALT/HALO CARBOXYLIC ACID CONDENSATE ADDITIVES FOR LUBRICANTS

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 857,839, Dec. 5, 1977, Pat. No. 4,131,554, which is a continuation-in-part of Ser. No. 608,380, Aug. 27, 1975, Pat. No. 4,067,698. This application Dec. 4, 1978, Ser. No. 966,241
Int. Cl.[2] C10M *1/30, 1/24, 3/24, 3/18*
U.S. Cl. 252—33.6 33 Claims

1. A composition made by reacting (I) at least one phenoxide metal salt of a bridged phenol having (a) at least 2 and up to about 20 phenolic moieties or thiophenol analogs thereof and (b) at least 1 and up to about 19 bridging linkages independently selected from the group consisting of covalent carbon-to-carbon single bonds, ether linkages, sulfide linkages, polysulfide linkages of two to six sulfur atoms, sulfinyl linkages, sulfonyl linkages, methylene linkages, alkylene linkages, di(lower alkyl)methylene linkages, lower alkylene ether linkages, lower alkylene sulfide linkages, lower alkylene polysulfide linkages of two to six sulfur atoms, amino linkages, polyamino linkages and mixtures of said divalent bridging linkages with (II) at least one carboxylic acid reagent having 1 to about 3 carboxyl-based groups and a halogen-substituted hydrocarbon-based aliphatic or alicyclic group containing a halogen atom.

4,216,100

PENTAERYTHRITOL-FATTY ACID ESTER LUBRICANT COMPOSITION

Roberta Yaffe, Beacon, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 728,569, Oct. 1, 1976, abandoned. This application Aug. 3, 1978, Ser. No. 930,633
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.7 7 Claims

1. A lubricating oil composition comprising a major portion of an aliphatic ester base oil having lubricating properties formed from the reaction of pentaerythritol and a saturated hydrocarbyl monocarboxylic acid having from about 2 to 18 carbon atoms per molecule, containing

(a) from about 0.005 to 0.20 weight percent of a bis(alkylthio)-1,3,4-thiadiazole represented by the formula:

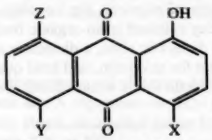
in which R and R′ represent alkyl radicals having from 3 to 14 carbon atoms,

(b) from about 0.3 to 5 percent by weight of the lubricating oil composition of an alkyl or alkaryl substituted phenyl naphthylamine in which the alkyl radical and the alkaryl radical have from 4 to 12 and from 7 to 12 carbon atoms respectively,

(c) from about 0.3 to 5 percent of a dialkyldiphenylamine in which the alkyl radicals have from 4 to 12 carbon atoms,

(d) from about 0.25 to 10 percent of a trihydrocarbyl phosphate in which said hydrocarbyl radical contains an aryl ring and contains from about 6 to 18 carbon atoms, and

(e) from about 0.04 to 2 weight percent of a polyhydroxy-substituted anthraquinone represented by the formula:



in which X, Y and Z each represent hydrogen or a hydroxyl group and at least one of these is a hyroxyl group.

4,216,101

ELECTRICAL INSULATING COMPOSITION BASED ON POLYOLEFIN CONTAINING DYE ADDITIVES AS VOLTAGE STABILIZERS

H. John Davis, Beaconsfield, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed Sep. 20, 1978, Ser. No. 944,021
Int. Cl.² H01B *3/30*
U.S. Cl. 252—63.2 **7 Claims**

1. An electrical insulating composition comprising a polyolefin, at least one additive for improving the voltage stability of the electrical insulating composition selected from the class of dyes identified in the Color Index as being of the solvent type possessing either an azo or a quinoid type structure, or having a xanthene structure exhibiting fluorescence, which dyes are soluble in or melt miscible with the polyolefin, and other conventional additives used in electrical insulation materials.

4,216,102

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION CONSISTING ESSENTIALLY OF $PB(FE_{1/2}NB_{1/2})O_3$-$PB(MG_{1/3}NB_{2/3})O_3$

Kiyoshi Furukawa, Akita; Shinobu Fujiwara, Nikahomachi; Nobuaki Kikuchi, Akita; Osamu Iizawa, Honjo; Hitoshi Tanaka, Nikahomachi, and Hisayoshi Ueoka, Yachiyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,833
Claims priority, application Japan, Apr. 10, 1978, 53-41974; Apr. 14, 1978, 53-43859; Apr. 14, 1978, 53-43860; May 17, 1978, 53-58661; May 17, 1978, 53-58662; Jun. 6, 1978, 53-68038; Jun. 20, 1978, 53-74499; Aug. 3, 1978, 53-80648
Int. Cl.² H01B *3/12*
U.S. Cl. 252—63.2 **25 Claims**

1. A high dielectric constant type-, ceramic composition, hereinafter referred to as the basic ceramic composition, consisting essentially of from 67.99 to 68.58% of PbO, from 0.61 to 8.51% of Fe_2O_3, from 1.23 to 3.92% of MgO and from 22.27 to 26.89% of Nb_2O_5, all percentages being by weight based on the basic composition.

4,216,103

HIGH DIELECTRIC CONSTANT TYPE CERAMIC COMPOSITION CONSISTING ESSENTIALLY OF $PB(FE_{\frac{1}{2}}NB_{\frac{1}{2}})O_3$-$PB(MG_{\frac{1}{3}}TA_{\frac{2}{3}})O_3$

Shinobu Fujiwara, Nikahomachi; Kiyoshi Furukawa; Nobuaki Kikuchi, both of Akita; Osamu Iizawa, Honjo; Hitoshi Tanaka, Nikahomachi, and Hisayoshi Ueoka, Yachiyo, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1979, Ser. No. 27,834
Claims priority, application Japan, Apr. 13, 1978, 53-43560; Apr. 24, 1978, 53-48432; Apr. 24, 1978, 53-48433; May 6, 1978, 53-53931; May 6, 1978, 53-53932; Jun. 6, 1978, 53-68040; Jun. 20, 1978, 53-74501; Jul. 3, 1978, 53-80650
Int. Cl.² H01B *3/12*
U.S. Cl. 252—63.2 **28 Claims**

1. A high dielectric constant type-, ceramic composition, referred to as the basic ceramic composition, consisting essentially of from 60.72 to 67.17% of PbO, from 3.26 to 11.41% of Fe_2O_3, from 5.42 to 19.00% of Nb_2O_5, from 0.20 to 2.56% of MgO and from 2.22 to 28.04% of Ta_2O_5, all percentages being by weight based on the basic composition.

4,216,104

PROCESS OF MANUFACTURING A GAS-GENERATING CLEANING MATERIAL

Gerhard Gergely, Gartengasse 8, Wien, Austria (1053)

Filed Dec. 5, 1977, Ser. No. 857,843
Claims priority, application Austria, Dec. 3, 1976, 8978/76
Int. Cl.² C11D *11/00, 7/12;* B08B *1/00*
U.S. Cl. 252—91 **9 Claims**

1. A process of manufacturing a cleaning element comprising

producing a first solution or suspension from a first mixture of components comprising at least one substance capable of forming a gas selected from the group consisting of calcium hydride, an oxygen generating substance and a CO_2-generating substance; and a water-soluble adhesive;

producing a second solution or suspension from a second mixture of components comprising at least one substance triggering the formation of gas, and a water-soluble adhesive;

adding to either said first or second mixtures or both of said mixtures a detergent selected from the group consisting of anionic, cationic and nonionogenic surfactants;

impregnating or coating a porous, flexible support consisting of paper, fabric or sponge with said first solution or suspension in at least one first area of said support, and drying the so-impregnated support; and

impregnating or coating said porous, flexible support in at least one second area of said support separate from said first area, with said second solution or suspension, and drying the so-impregnated support.

4,216,105

COMPOSITIONS FOR THE OPTICAL WHITENING OF ORGANIC MATERIALS AND USE THEREOF

Hugh Davidson, Castleford; Keith T. Johnson, Pontefract; Brian E. Leggeter, Wakefield, and Anthony J. Moore, Leeds, all of England, assignors to Hickson & Welch Limited, Castleford, England

Continuation of Ser. No. 797,383, May 16, 1977, abandoned, which is a division of Ser. No. 636,089, Nov. 28, 1975, Pat. No. 4,093,645, which is a division of Ser. No. 382,168, Jul. 24, 1973, Pat. No. 3,940,437. This application Nov. 30, 1978, Ser. No. 965,048

Claims priority, application United Kingdom, Jul. 26, 1972, 35033/72

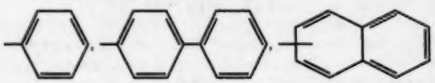
Int. Cl.[2] C11D *3/42, 9/44*

U.S. Cl. 252—174.19 11 Claims

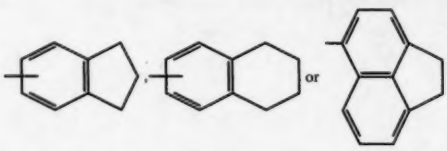
1. A composition for the optical whitening and brightening of organic materials, consisting essentially of an effective amount of a compound of the formula:

$$R—CH=CH—W—CH=CH—R' \quad I$$

wherein R and R', which may be the same or different, each represents a group of the formula:

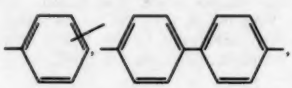


I(a) I(b) I(c)

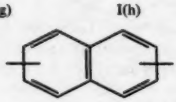


I(d) I(e) I(f)

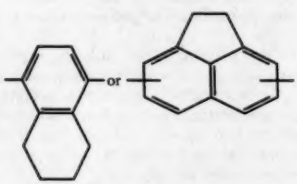
and W represents a group of the formula:



I(g) I(h)



I(j)



I(k) I(l).

which groups may be unsubstituted or substituted by at least one non-chromophoric substituent selected from the group consisting of a sulphonic acid group, a carboxylic acid group, a sulfone group, cyano, hydroxyl, C_{1-6} alkoxy, C_{1-6} alkyl unsubstituted or substituted by a sulphonic acid group, oxadiazolyl unsubstituted or substituted by C_{1-6} alkyl or phenyl, halogen and, when said substituent is a sulphonic acid or carboxylic acid group, an ester, amide, halide or salt thereof; said compound of formula I containing at least one of the groups I(d), I(e), I(f), I(k) and I(l), and a carrier therefor.

4,216,106

CALCINED CLAY CONTAINING DIELECTRIC COATING COMPOSITION

Joseph E. Miller, [73] Assignee: The Sherwin Williams Co., Cleveland, Ohio, Homewood, Ill.

Continuation-in-part of Ser. No. 855,115, Nov. 26, 1977, abandoned. This application Dec. 18, 1978, Ser. No. 970,268

Int. Cl.[2] H01B *3/02;* B37B *9/04*

U.S. Cl. 252—63.5 9 Claims

1. An improved coating composition for the production of reproductive papers and papers useful in static charge transfer reproduction processes characterized by improved image density qualities which coating comprises a fluid dispersion of a controlled quantity of pigment, the essential clay pigment of which is kaolin clay calcined to an organic free state prior to its dispersion into a dielectric resin, a dielectric resin, and a volatile organic solvent for said resin, said total quantity of pigment weight to the said resin solids weight being greater than a ratio of about 1.75/1.

4,216,107

ORGANIC TITANIUM COMPOUNDS AS VISCOSITY IMPROVERS FOR POLYOL COMPOUNDS

Herwart C. Vogt, Grosse Ile; Bernardas Brizgys, Southgate; Moses Cenker, Trenton, and John T. Patton, Jr., Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 756,097, Jan. 3, 1977, abandoned. This application May 11, 1978, Ser. No. 904,861

Int. Cl.[2] C08K *5/56;* C07F *7/28;* C08K *5/06, 5/10*

U.S. Cl. 252—182 14 Claims

8. The unfilled polyol composition consisting essentially of polyester or polyether polyols and mixtures thereof in combination with an effective amount of an organic titanate having the formula

$$(RCO)_{5-n}Ti(OR')_{n-1}$$

wherein R is an aliphatic radical having from 1 to 17 carbon atoms, R' is a radical selected from the group consisting of an aliphatic radical having from 1 to 18 carbon atoms, an alicyclic radical having between 1 and 3 rings, 5 or 6 carbon atoms per ring, and between 5 and 18 carbon atoms per molecule, and an aromatic radical having between 1 and 3 rings and between 6 and 18 carbon atoms per molecule, and n is an integer of 1-5.

4,216,108

HARDENING SOLUTION FOR PROTEINACEOUS MATERIALS

Francis J. Sels, Kontich; Hendrik E. Kokelenberg, Merksem, and George F. van Veelen, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 904,277, May 9, 1978. This application Mar. 27, 1979, Ser. No. 24,397

Claims priority, application United Kingdom, May 10, 1977, 19576/77

Int. Cl.[2] C08K *1/82*

U.S. Cl. 252—182 5 Claims

1. A hardening solution for proteinaceous materials compris-

ing an aqueous solution of a partial hydrolysis product of cyanuric chloride buffered with a water-soluble borate.

4,216,109

LIQUID CRYSTAL COMPOSITION AND METHOD FOR MAKING SAME

Yutaka Mizukuchi, Saitama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 771,991, Feb. 25, 1977, Pat. No. 4,138,359. This application Nov. 14, 1978, Ser. No. 960,595

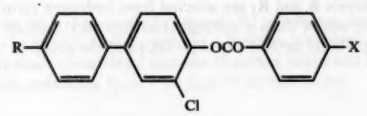
Claims priority, application Japan, May 25, 1976, 51/59629

The portion of the term of this patent subsequent to Feb. 6, 1995, has been disclaimed.

Int. Cl.[2] **C09K** *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **7 Claims**

1. A liquid crystal compound having the formula:



where R represents an alkyl group having five to eight carbon atoms and X represents an alkyl group having five to ten carbon atoms, an alkoxyl group having five to eight carbon atoms, CN or NO_2.

4,216,110

METHOD OF MAKING CRACK-FREE ZIRCONIUM HYDRIDE

Richard W. Sullivan, Denver, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 1, 1966, Ser. No. 591,946

Int. Cl.[2] **C01B** *6/02*

U.S. Cl. 252—301.1 R **10 Claims**

1. A process for producing crack-free hydrides comprising alloying less than 2.0 w/o of a material selected from the class consisting of beryllium; beryllium and nickel; beryllium and scandium; nickel and scandium; and beryllium, nickel and scandium with zirconium or an alloy of zirconium and up to about 10 w/o of uranium, and thereafter hydriding.

4,216,111

STABLE DISPERSIONS OF FLUORESCENT WHITENING AGENTS OF THE BIS-TRIAZINYLAMINOSTILBENE GROUP IN FREE ACID FORM AND METHOD OF PREPARING SAME

John D. Thompson, Upton, England, assignor to Hickson & Welch Limited, Castleford, England

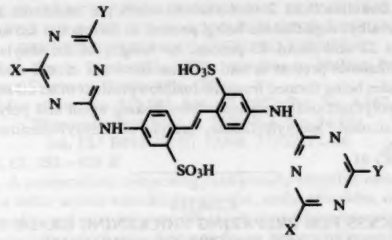
Continuation of Ser. No. 860,904, Dec. 15, 1977, abandoned, which is a continuation of Ser. No. 706,622, Jul. 19, 1976, abandoned. This application Nov. 29, 1978, Ser. No. 964,614

Claims priority, application United Kingdom, Jul. 25, 1975, 31243/75

Int. Cl.[2] **C07D** *403/10, 403/14*

U.S. Cl. 252—301.23 **13 Claims**

1. A method of preparing a stable aqueous suspension comprising 10–35% by weight of a compound of the formula



in which X and Y may be the same or different and each represent an amino or substituted amino group, which method consists essentially of

(A) preparing said compound in flocculated form by acidification of an aqueous suspension of a salt of said compound with a mineral acid;

(B) forming an aqueous mixture containing the flocculated compound and up to 0.5 equivalents of a base per mole of said compound, and

(C) agitating said aqueous mixture in the absence of a surfactant to deflocculate it and form said stable suspension.

4,216,112

PRESSURE-SENSITIVE MICROCAPSULES CONTAINING ALKYLNAPHTHALENE SOLVENT AND PROCESS FOR THEIR PRODUCTION

David N. Vincent, Glenview, and Cheng H. Chang, Naperville, both of Ill., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 500,903, Aug. 26, 1974, Pat. No. 4,071,469, which is a continuation-in-part of Ser. No. 353,809, Apr. 23, 1973, abandoned. This application Sep. 21, 1977, Ser. No. 835,165

Int. Cl.[2] **B01J** *13/02*

U.S. Cl. 252—316 **13 Claims**

1. A process for the production of microcapsules which comprises admixing:

(A) a solvent composition for use in the absence of a halogenated solvent wherein the solvent consists essentially of a combination of a mono-alkyl naphthalene, wherein said alkyl group contains from 1 to 3 carbon atoms per molecule, and a di-alkyl naphthalene, wherein each of said alkyl groups in said di-alkyl naphthalene contains from 2 to 4 carbon atoms per molecule, said mono-alkyl naphthalene being present in an amount between about 25 and about 40 percent by weight of the alkylated naphthalenes present in said solvent, said solvent composition containing an oil-soluble, polyfunctional isocyanate cross-linking agent selected from the group consisting of the adducts of 4,4'-diphenyl methane diisocyanate, triphenyl methane triisocyanate and toluene diisocyanate with polyhydric alcohols; and

(B) an aqueous solution of an organic, polymeric emulsifying agent containing a plurality of hydroxyl groups, comprising polyvinyl alcohol, methylcellulose, starch or benzyl-substituted starch, said admixing being conducted under conditions to form an oil-in-water emulsion, wherein said solvent composition is dispersed in the form of emulsion droplets in an aqueous continuous phase, said cross-linking agent interacting with the hydroxyl groups of said polymeric emulsifying agent to form a solid, cross-linked resinous capsule wall surrounding each of said solvent composition droplets.

8. Pressure-sensitive microcapsules containing a solvent composition for use in the absence of a halogenated solvent wherein said solvent consists essentially of a combination of a mono-alkyl naphthalene, wherein said alkyl group contains from 1 to 3 carbon atoms per molecule, and a di-alkyl naphtha-

lene, wherein each of said alkyl groups in said di-alkyl naphthalene contains from 2 to 4 carbon atoms per molecule, said mono-alkyl naphthalene being present in an amount between about 25 and about 40 percent by weight of the alkylated naphthalenes present in said solvent, the walls of said microcapsules being formed from the reaction product of an oil-soluble, polyfunctional isocyanate cross-linking agent and polyvinyl alcohol, methylcellulose, starch or benzyl-substituted starch.

4,216,113

PROCESS FOR PREPARING THICKENING GRADE OF SILICA AND PROCESS OF USING SAME

Milton E. Winyall, Columbia, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 184,906, Sep. 29, 1971, abandoned. This application Jan. 18, 1973, Ser. No. 324,711

Int. Cl.[3] **B01J** *13/00*

U.S. Cl. 252—317 **15 Claims**

1. A process for preparing a thickening grade of silica comprising

forming an alkali silicate solution having a definite silica concentration and a water soluble silica desolubilizing agent concentration;

adding an acid to reduce the pH to about 11.2 to 10.6, thereby forming a silica hydrosol which converts to a silica hydrogel within about 1 to 15 minutes;

aging the silica hydrogel for about 2 to 120 at 20° C. to 95° C. minutes;

neutralizing said silica hydrogel by adding an acid to reduce the pH to about 10 to 3;

washing and recovering a porous silica hydrogel;

reducing the water content of said porous silica hydrogel to less than about 15 percent by weight by exchange with a water miscible organic liquid to form an organic loaded porous silica;

feeding said organic loaded porous silica to a fluid energy mill for concurrent drying and deaggregation; and

recovering said thickening grade of silica.

4,216,114

DEMULSIFICATION PROCESS

Alan S. Baker, Slough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 30, 1978, Ser. No. 955,604

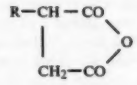
Claims priority, application United Kingdom, Nov. 18, 1977, 48086/77

Int. Cl.[2] **B01D** *17/04*

U.S. Cl. 252—341 **11 Claims**

1. A method for the demulsification of a water-in-oil emulsion which comprises contacting the emulsion with a polyester obtained by the condensation of:

(A) an alk(en)yl succinic anhydride of the formula



where R is an alkyl or alkenyl radical containing from 9 to 18 carbon atoms;

(B) a polyalkylene glycol which has an average molecular weight of less than 500 and is soluble in water to the extent of at least 5% by weight at 25° C.;

(C) a polyhydric alcohol having three or more hydroxyl groups capable of reacting with the anhydride (A); the polyester so obtained containing 20–40% by weight of residues of the polyalkylene glycol (B) and at least 1% by weight of residues of the polyhydric alcohol (C).

4,216,115

PREVENTION OF DISCOLORATION IN SUBSTITUTED DIPHENYLAMINES

Donald E. Miller, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

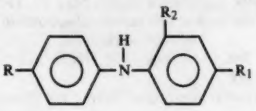
Filed Nov. 22, 1978, Ser. No. 963,235

Int. Cl.[2] **C09K** *15/32*

U.S. Cl. 252—400 R **5 Claims**

1. In a solid aromatic amine gas-resister composition comprising:

A. a liquid diphenylamine having the formula



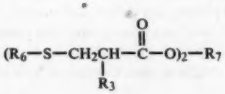
wherein R and R_1 are selected from hydrogen (provided only one of them is hydrogen) tertiary alkyl radicals having 4 to 12 carbon atoms (4–12C) and the group

wherein R_3 is selected from H and methyl and R_4 is selected from phenyl and p-tolyl radicals; and R_2 is selected from H and 1-methyl benzyl,

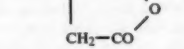
B. absorbed on a hydrous calcium silicate filler material, the improvement which comprises those compositions which contain a color inhibitor selected from the group consisting of trialkylol amines having the structure:

wherein R_5 is an alkylene radical of from 2 to 5 carbons (2–5C);

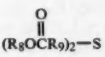
glycol diesters having the following structure:



wherein R_6 is an alkyl radical (1–24C), R_7 is a polyalkyl glycol radical having the structure:



wherein n is an integer from 1 to 7; and dialkyl esters of thiodicarboxylic acids having the structure:



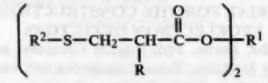
wherein R_8 is an alkyl (11–15C) and R_9 is an alkylene (2–3C), in a weight ratio of color inhibitor to p-styrenated diphenylamine of from 0.25:99.75 to 5:95, and wherein the weight ratio of liquid diphenylamine plus color inhibitor to the filler material of Part B is from 80:20 to 50:50.

4,216,116
PHENOLIC/ESTER ANTIOXIDANT SYSTEM

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 20, 1977, Ser. No. 843,772
Int. Cl.[2] C09K *15/08*
U.S. Cl. 252—404 3 Claims

1. An antioxidant combination comprised of (A) a phenolic antioxidant and (B) a polyethyleneoxydiester of a thiopropionic acid of the formula



wherein R is hydrogen or a methyl group, wherein R^1 is a polyalkylene glycol ether radical having the structure

$$(CH_2—CH_2—O)_{n1}CH_2—CH_2—$$

wherein n^1 is 1 through 7, wherein R^2 is selected from the group of alkyl radicals containing 1 through 24 carbon atoms, aryl radicals containing 6 through 12 carbon atoms and aralkyl radicals containing from 7 through 12 carbon atoms.

4,216,117
LIPOPROTEIN DILUENT OR SOLUTION AND METHOD USEFUL IN THE PREPARATION OF ASSAY REFERENCE MATERIALS

Gary J. Proksch, 5514 N. Greenview Dr., Indianapolis, Ind. 46220, and Dean P. Bonderman, 586 W. 77th South Dr., Indianapolis, Ind. 46260

Filed May 15, 1978, Ser. No. 905,967
Int. Cl.[2] G01N *31/00, 33/16*
U.S. Cl. 252—408 20 Claims

1. A method for the preparation of a standard or reference material for use in assay procedures which comprises adding a lipoprotein diluent containing a significant amount of turbidity-potential lipoprotein and being essentially free from lipoprotein-degrading enzymes to a lyophilized serum base which is free from a significant amount of turbidity-potential lipoproteins.

4,216,118
PROCESS FOR RECOVERING VANADIUM ACCUMULATED ON SPENT CATALYST

Takechiyo Yoshida, Tokyo; Masato Ushiyama, Ebina, and Tohru Yokoyama, Yokohama, all of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jan. 20, 1978, Ser. No. 870,985
Claims priority, application Japan, Jan. 20, 1977, 52-4362
Int. Cl.[2] B01J *23/90, 23/92*
U.S. Cl. 252—415 20 Claims

1. A process for recovering vanadium accumulated on spent catalysts, the vanadium being recovered as a chloride thereof, which process comprises chlorinating a spent catalyst which has not been subjected to prior oxidation and having vanadium accumulated thereon substantially in the form of sulfides with a chlorinating agent selected from the group consisting of chlorine, hydrogen chloride, carbon tetrachloride, S_2Cl_2 and mixtures thereof under a temperature of from room temperature to 600° C. and a pressure above atmospheric so that substantially all of the vanadium accumulated on said spent catalyst can be chlorinated to a volatile chloride which is mainly vanadium tetrachloride.

4,216,119
CATALYST SYSTEM COMPRISING ELEMENTAL SULFUR OR A SULFUR HALIDE FOR CONVERSION OF DIENES OR MONOOLEFINS TO DIESTERS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

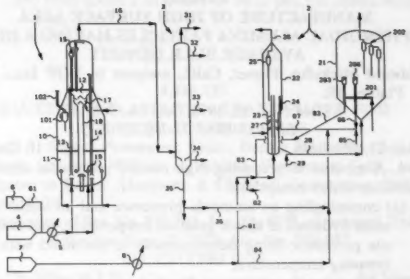
Division of Ser. No. 827,641, Aug. 25, 1977, Pat. No. 4,162,363. This application Mar. 1, 1979, Ser. No. 16,751
Int. Cl.[2] B01J *31/02, 31/04, 27/02, 27/06*
U.S. Cl. 252—429 R 18 Claims

1. A composition comprising catalytically effective ratios of (A) a sulfur source selected from sulfur, sulfur chlorides, sulfur bromides, and mixtures; and (B) an alkali metal compound; (C) a haloolefin which is a chloroolefin or bromoolefin, and optionally (D) carboxylic acid media.

4,216,120
ANTIMONY CONTAINING FINES PLUS CRACKING CATALYST COMPOSITION

Richard H. Nielsen; Dwight L. McKay, and Glenn H Dale, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 773,234, Mar. 1, 1977, abandoned. This application Jun. 29, 1978, Ser. No. 920,617
Int. Cl.[2] B01J *31/18, 29/16, 29/26, 29/36*
U.S. Cl. 252—430 3 Claims



1. A passivated cracking catalyst composition containing an antimony passivating agent said catalyst composition being useful for gas oil cracking and comprising

(a) a cracking catalyst useful for gas oil cracking, and

(b) as said passivating agent, used cracking catalyst fines containing 0.4 to 10 wt. % of antimony based on antimony containing fines which used cracking catalyst fines have been withdrawn from a heavy, highly metal loaded oil cracking process, in an amount sufficient to mitigate the detrimental effects of metals.

4,216,121
CATALYST, ITS PREPARATION AND USE IN THE POLYMERIZATION OF BUTADIENE

Gerd Sylvester, Leverkusen; Manfred Beck, Odenthal; Josef Witte, Cologne, and Gottfried Pampus, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,445
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803095
Int. Cl.[2] C08F *4/64*
U.S. Cl. 252—431 C 5 Claims

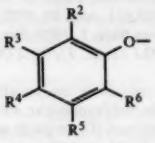
1. A catalyst composition which comprises

(a) TiI_4 and/or $TiOR^1I_3$, wherein R^1 represents a straight- or branched-chain C_1–C_8 alkyl radical;

(b) AlR_3 and/or $HAlR_2$, wherein R represents a straight- or branched-chain C_1–C_8 alkyl radical;

(c) $TiXCl_3$, wherein X represents a straight- or branched-chain C_1–C_{12} alkoxy radical which is optionally substi-

tuted one or more times by halogen, C_6 or C_7 cycloalkyl and/or phenyl; a C_5–C_7 cycloalkoxy radical which is optionally substituted one or more times by C_1–C_5 alkyl groups; a phenoxy group corresponding to the formula:



wherein R^2 to R^6, which may be the same or different, each represents hydrogen or a straight- or branched-chain C_1–C_5 alkyl radical; a carboxyl group corresponding to the formula R^7—COO wherein R^7 represents a straight- or branched-chain C_1–C_{12} alkyl radical which is optionally substituted one or more times by halogen, C_5–C_7 cycloalkyl and/or phenyl; a C_5–C_7 cycloalkyl radical which is optionally substituted one or more times by C_1–C_5 alkyl groups; or phenyl, said composition containing components (a) and (c) in a molar ratio of (c) to (a) of from 0.1:1 to 1:1 and containing component (b) in a molar ratio of (b) to the sum of (a) and (c) of from 2:1 to 5:1.

4,216,122

MANUFACTURE OF HIGH SURFACE AREA SPHEROIDAL ALUMINA PARTICLES HAVING A HIGH AVERAGE BULK DENSITY

Edward Michalko, Hemet, Calif., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 13, 1978, Ser. No. 960,140

Int. Cl.[2] B01J *21/04, 37/00*

U.S. Cl. 252—448 **10 Claims**

1. A method of preparing high density spheroidal alumina particles which comprises:

(a) commingling an ammonia precursor and an acidic alumina hydrosol at below gelation temperature, said ammonia precursor being decomposable to ammonia with increasing temperature;

(b) dispersing the mixture as droplets in a hot oil bath maintained at a temperature effecting decomposition of said ammonia precursor and the formation of spheroidal hydrogel particles therein;

(c) separating and aging the spheroidal particles for a period of from about 5 to about 25 hours at a temperature of from about 75° C. to about 105° C. in an aqueous ammoniacal solution containing from about 0.5 to about 3 wt.% ammonia and an ammonium salt concentration in the range of from about 4 to about 20 wt.%, and adjusting the ABD of the spheroidal alumina product in the range of from about 0.6 to about 0.8 gms/cc by varying the ammonium salt concentration of said aqueous ammoniacal solution in the stated range; and,

(d) water-washing, drying, and calcining the aged spheroidal alumina particles.

4,216,123

CATALYST FOR STEAM REFORMING OF HYDROCARBONS

Reginald G. S. Banks, Solihull, and Alan Williams, Cheswick Green, both of England, assignors to British Gas Corporation, London, England

Filed Jul. 11, 1978, Ser. No. 923,550

Claims priority, application United Kingdom, Jul. 11, 1977, 5655/77

Int. Cl.[2] B01J *21/04, 23/78*

U.S. Cl. 252—466 J **8 Claims**

1. In a coprecipitated catalyst for steam reforming hydrocarbons comprising a metal of Group VIII of the Periodic Table, alumina and optionally, minor amounts of an alkali or alkaline earth metal, the improvement consisting in that, in the calcined but unreduced form of the catalyst,

(i) at least 55% of the pore volume of pores having a pore radius between 12 and 120 Angstrom Units is in the range of 12 to 30 Angstrom Units, and

(ii) the ratio (Q) of the pore volume contained in pores of radius 10 to 50 Angstrom Units to the pore volume contained in pores of radius 50–300 Angstrom Units is at least 5:1.

4,216,124

MATERIAL FOR THE CONSTRUCTION OF EXOELECTRON DETECTORS

Georg Holzapfel, Berlin, Fed. Rep. of Germany, and Maurice Petel, Bourg la Reine, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 16, 1977, Ser. No. 833,984

Claims priority, application France, Sep. 17, 1976, 76 27983

Int. Cl.[2] H01B *1/06, 1/08*

U.S. Cl. 252—518 **3 Claims**

1. Material for forming the sensitive plate of a device for the measurement of radiations by emission of exoelectrons, said material being a mixture of a first substance selected from the group consisting of alumina, beryllium oxide, $CaSO_4$, $BaSO_4$, CaF_2, $SrSO_4$, and LiF containing traps for the electrons and emitting exoelectrons by thermal and also optical stimulation and a second substance of alumina crystalized in the β phase, said material having high mechanical strength.

4,216,125

DETERGENT COMPOSITIONS WITH SILANE-ZEOLITE SILICATE BUILDER

Thomas C. Campbell, Paoli, Pa.; Elliot P. Hertzenberg, Wilmington, Del., and Howard S. Sherry, Cherry Hill, N.J., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 842,425, Oct. 14, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,537

Int. Cl.[2] C01B *33/28;* **C02B** *1/44;* **C11D** *3/08, 3/12*

U.S. Cl. 252—527 **14 Claims**

1. A detergent composition comprising:

(a) 8 to 30% by weight of one or more organic surfactants selected from the group consisting of anionic, nonionics and ampholytic surfactants; and

(b) 13 to 85% by weight of a builder system consisting of:

(1) 5 to 60 parts by weight of a hydrophilic silane-zeolite composite containing 0.5 to 3.35% by weight of hydrophilic silane, and the remainder to 100% crystalline sodium alumino silicate containing 15 to 35% water; and

(2) 8 to 35 parts by weight of water soluble alkali metal silicate solids with a molar composition equivalent to 1.0 to 4.0 moles of SiO_2 per mole of Na_2O.

7. The detergent composition of claim 1 which also includes 0 to 15% of an auxiliary builder selected from the group consisting of sodium and potassium salts of tripolyphosphate, pyrophosphate, hexametaphosphate, ethylenediaminotetracetic acid, nitrilotriacetic acid, citric acid and citric acid isomers.

4,216,126

ACCELERATED RUBBER COMPOSITION

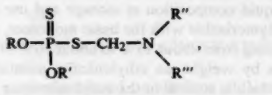
Edward L. Kay, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sep. 28, 1978, Ser. No. 946,911

Int. Cl.[2] C08F *8/32;* **C08L** *7/00;* **C08K** *5/17*

U.S. Cl. 260—5 **13 Claims**

1. Vulcanizable rubber stock compounded so as to contain and be comprised of an effective minor proportion of an accelerator additive that is an amine-substituted ester of phosphorodithioic acid and which is of the Formula:



(I)

wherein R, R', R'' and R''' are independently selected from the group consisting of linear, branch-structured, cyclic aliphatic and aromatic radicals and mixtures thereof independently containing from 1 to about 12 carbon atoms and in which group, additionally, R'' and R''' optionally can be individually albeit not simultaneously a proton.

4,216,127

ENKEPHALIN ANALOGUES

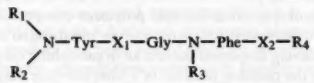
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,549

Int. Cl.[2] C08L *37/00;* **C07C** *103/52;* **A61K** *37/00*

U.S. Cl. 260—8 **7 Claims**

1. A compound of the formula:



in which

R_1 is hydrogen, methyl, allyl, cyclopropylmethyl, cyclobutylmethyl or Arg;

R_2 is hydrogen or methyl;

X_1 is D—Asn or D—Gln;

R_3 is hydrogen or methyl;

X_2 is D—Asn, D—Gln or D—Cys; and

R_4 is the hydroxyl group of the l-carboxy substituent of the C-terminal amino acid moiety or a lower alkyl ester, amide or lower alkyl amide thereof or the $—CH_2OH$ reduction product thereof; a protected peptido resin thereof;

or a pharmaceutically acceptable salt thereof.

4,216,128

ENKEPHALIN ANALOGUES

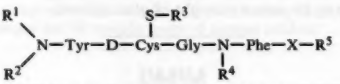
Dimitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Jul. 5, 1979, Ser. No. 54,550

Int. Cl.[2] C08L *37/00*

U.S. Cl. 260—8 **6 Claims**

1. A polypeptide of the formula:



in which

R^1 is hydrogen, methyl, allyl, cyclopropylmethyl, cyclobutylmethyl or Arg;

R^2 is hydrogen or methyl;

R^3 is hydrogen, (lower)alkylthio or a repeating unit of the depicted polypeptide forming a dimeric dithioether;

R^4 is hydrogen or methyl;

X is D-ser, D-Thr, D-Asn, D-Asp, D-Gln, D-Glu, D-His, D-Lys, or D-Arg;

and R^5 is the hydroxyl moiety of the 1-carboxyl group of the C-terminal amino acid or a (lower)alkyl ester, amide or (lower)alkyl amide thereof or a $—CH_2OH$ group replacing said 1-carboxyl group, and their protected peptidoresin intermediates,

or a pharmaceutically acceptable salt thereof.

4,216,129

MOLDING COMPOSITION COMPRISING A BLEND OF POLY (TETRAMETHYLENE TEREPHTHALATE) AND POLY(TETRAMETHYLENE TEREPHTHALATE) MODIFIED WITH DIMER ACID

Burns Davis, and Freddie A. Shepherd, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 868,764, Jan. 12, 1978, abandoned. This application Feb. 7, 1979, Ser. No. 10,190

Int. Cl.[2] C08G *63/02;* **C09J** *3/16*

U.S. Cl. 260—22 D **12 Claims**

1. A composition comprising an admixture of

(A) from about 95 to about 5 parts by weight poly(tetramethylene terephthalate) having an inherent viscosity of about 0.5 or more measured at 25° C. using 0.50 percent of polymer per 100 mol. of a solvent composed of 60 percent by weight of phenol and 40 percent by weight of tetrachloroethane, and

(B) from about 5 to about 95 parts by weight of a polyester having an inherent viscosity of about 0.5 or more measured at 25° C. using 0.50 percent of polymer per 100 ml. of a solvent composed of 60 percent by weight of phenol and 40 percent by weight of tetrachloroethane prepared from

(1) a dicarboxylic acid component which is

(a) from about 98 to about 40 mole percent terephthalic acid, and

(b) from about 2 to about 60 mole percent dimer acid, and

(2) tetramethylene glycol.

4,216,130

BAUXITE AS FLAME-RETARDANT FILLER FOR POLYMER COMPOSITIONS

Ronald J. Rigge, Pleasanton, Calif.; Burton J. Beadle, Baton Rouge, La., and William A. Belding, Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation of Ser. No. 870,794, Jan. 19, 1978, abandoned. This application Nov. 13, 1978, Ser. No. 959,957

Int. Cl.[2] C08J *9/30*

U.S. Cl. 260—29.7 R **9 Claims**

1. Flame retarded conventional natural or synthetic rubber latex compositions employed in the carpet industry for making foamed carpet backings, precoats and adhesives containing as flame-retarding filler a ground naturally occurring bauxite which is rendered compatible with the latex compositions and is characterized by an Al_2O_3 content from at least about 40% by weight to about 60% by weight, wherein the Al_2O_3 is in the hydrated form, balance Fe_2O_3, TiO_2, SiO_2 and other impurities, the ground bauxite being further characterized by a surface area of less than about 12 m^2/g when dried for 1 hour at about 100° C., a pH of at least about 6.5 when measured at 20° C. in an aqueous suspension containing 5 grams of ground bauxite/100 grams of water, a particle size distribution, wherein particles of less than about 3 microns in size constitute less than about 15% by weight of the ground bauxite and the amount of ground bauxite incorporated in the latex composition is sufficient to impart flame retardancy.

4,216,131

SMOOTH-LOOK FOOTWEAR COMPOSITION

Glenn R. Himes, and Judith E. Zweig, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 4, 1979, Ser. No. 35,980

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 AQ **10 Claims**

1. A non-delaminating polymeric composition comprising:

(a) 100 parts by weight of a mixture of a linear ABA block copolymer and a radial $(AB—_xBA$ block copolymer where x is greater than 1, the weight ratio of linear to radial block copolymer is between about 25/75 and about

90/10, each block A being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 25,000, each block B being an elastomeric conjugated diene polymer having an average molecular weight between about 15,000 and about 300,000, and said blocks A comprise 8–65% by weight of each copolymer;

(b) about 10 to about 50 parts by weight of a low density polyethylene having a melt flow index at 190° C. between about 0.4 and 5 and a specific gravity below 0.94;

(c) about 5 to about 100 parts by weight of an ethylene/vinyl acetate copolymer having a melt flow index at 190° C. between about 0.1 and 8;

(d) about 0 to about 200 parts by weight of a hydrocarbon rubber extending oil; and

(e) about 0 to about 250 parts by weight of a finely divided filler.

4,216,132

HDPE-CONTAINING FOOTWEAR COMPOSITION

Judith E. Zweig, and Glenn R. Himes, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 4, 1979, Ser. No. 36,274

Int. Cl.[2] C08K *5/01*

U.S. Cl. 260—33.6 AQ **11 Claims**

1. A non-delaminating polymeric composition comprising:

(a) 100 parts by weight of a mixture of a linear ABA block copolymer and a radial $(AB-)_xBA$ block copolymer where x is greater than 1, the weight ratio of linear to radial block copolymer is between about 25/75 and about 90/10, each block A being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 25,000, each block B being an elastomeric conjugated diene polymer having an average molecular weight between about 15,000 and about 300,000, and said blocks A comprise 8–65% by weight of each copolymer;

(b) about 10 to about 50 parts by weight of a high density polyethylene having a melt flow index at 190° C. between about 0.1 and 30 and a density greater than about 0.94;

(c) about 0 to about 200 parts by weight of a hydrocarbon rubber extending oil; and

(d) about 0 to about 250 parts by weight of a finely divided filler.

4,216,133

SHELL PROCESS FOUNDRY RESIN COMPOSITIONS

Calvin K. Johnson, Palos Heights, and Robert S. Craig, Hoffman Estates, both of Ill., assignors to Acme Resin Corporation, Forest Park, Ill.

Filed Mar. 22, 1978, Ser. No. 889,061

Int. Cl.[2] C08K *3/34, 3/36*

U.S. Cl. 260—38 **31 Claims**

1. A shell process foundry resin composition consisting essentially of a mixture of an uncured novolak resin, an effective amount of a curing agent for said resin and 0.5 to 10% based on the weight of the resin of a finely divided, siliceous material selected from the group consisting of fumed silica, kaolin clay, bentonite, attapulgus clay and mixtures thereof.

4,216,134

TRIALLYLCYANURATE OR TRIALLYLISOCYANURATE BASED ADHESIVE SEALANT SYSTEMS

Walter Brenner, 974 Columbus Dr., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 641,513, Dec. 17, 1975, abandoned. This application Oct. 12, 1977, Ser. No. 841,605

Int. Cl.[2] C08L *67/06;* **C08F** *8/30;* **C08G** *63/70;* **B01J** *3/16*

U.S. Cl. 260—40 R **14 Claims**

1. A liquid adhesive and sealant composition having extended shelf life when exposed to oxygen but capable of rapidly setting at room temperature upon exclusion from contact with oxygen comprising a mixture of a basic monomer selected from the group consisting of triallylcyanurate, triallylisocyanurate and mixtures thereof, a relatively low molecular weight prepolymer which is soluble in the basic monomer to give a liquid composition at storage and use temperatures and is copolymerizable with the basic monomer, said prepolymer comprising from about 15% to about 50% of the adhesive composition by weight, an ethylenically unsaturated diluent monomer which is soluble in the basic monomer and acts as a solvent for said prepolymer and is copolymerizable with both said basic monomer and said prepolymer, at least one polymerization inhibitor, at least one polymerization promotor and a peroxidetype polymerization initiator.

4,216,135

ORGANOPHILIC CLAYS AND THIXOTROPIC POLYESTER COMPOSITIONS CONTAINING THE SAME

Claude M. Finlayson, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,213

The portion of the term of this patent subsequent to Mar. 28, 1993, has been disclaimed.

Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—40 R **23 Claims**

1. A thixotropic cross-linkable polyester composition comprising an unsaturated polyester and an unsaturated aromatic monomer having dispersed therein an organophilic clay gellant comprising the reaction product of a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of clay and a methyl benzyl dialkyl ammonium compound or a dibenzyl dialkyl ammonium compound, said alkyl groups containing 8 to 20 carbon atoms wherein at least 5% have 8 to 14 carbon atoms and the amount of said ammonium compound reacted with said clay being from 100 to 130 milliequivalents per 100 grams of clay based upon 100% active clay, and wherein said organophilic clay gellant comprises up to 4% by weight of said composition.

4,216,136

FIRE RETARDANT RESIN COMPOSITIONS AND ARTICLES FORMED THEREOF

Vance A. Stayner, P.O. Box 63, Sugar Grove, Ill. 60554

Filed Jun. 16, 1978, Ser. No. 915,825

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—40 R **5 Claims**

1. A composition comprising about 25 to 90 percent by weight of a curable, synthetic resin, and about 75 to 10 percent by weight of a mixture of at least two of the following reinforcing fillers:

(1) up to 150 parts by weight of epsom salt,

(2) up to 150 parts by weight of hydrated borax,

(3) up to 20 parts by weight of glass spheres.

4,216,137

THERMALLY STABILIZED POLYOLEFIN COMPOSITIONS

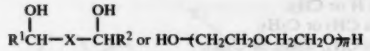
Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 5, 1978, Ser. No. 912,632

Int. Cl.[2] C08K *5/51;* **C08L** *23/06, 23/12*

U.S. Cl. 260—42.46 **7 Claims**

1. A polyolefin composition containing, based on the weight of the polyolefin, about 0.1 to 10 weight percent of a phenol terpene resin, about 0.1 to 5 weight percent of a sulfur-containing secondary antioxidant and about 0.1 to 5 weight percent of a phosphonitrilic composition derived from a phosphonitrilic halide and a hydroxy compound selected from an alkanol containing 1 to 20 carbon atoms and a diol having the formula



wherein X is a covalent bond or alkylene of 1 to about 12 carbon atoms, R^1 and R^2 are the same or different and are hydrogen or alkyl having 1 to about 6 carbon atoms and n is an integer of 1 to about 200.

4,216,138

FLAME-RESISTANT POLYOLEFIN COMPOSITIONS

Howard W. Bost, and Tommey A. Yokley, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 12, 1976, Ser. No. 713,778
Int. Cl.[2] C08K *5/52*
U.S. Cl. 260—45.75 B **10 Claims**

1. A flame-resistant polyolefin composition consisting essentially of (1) normally solid polyolefin; (2) a phosphorus-containing flame retardant comprising the reaction product of (a) at least one phosphorus oxide compound of the formula $(P_2O_5)_{0.5-1.0}(H_2O)_{0.0-1.5}$, (b) melamine, and (c) at least one saturated open-chain polyol containing from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups per molecule, which reaction product has been heated prior to incorporation into said polyolefin composition under such conditions that said reaction product will not cause significant foaming of the polyolefin composition when said polyolefin composition is subjected to molding conditions; and (3) antimony trioxide; wherein said phosphorus-containing flame retardant is present in an amount that alone would be insufficient to impart to said polyolefin a flame resistance rating of V-O according to the Modified UL-94 test and wherein said antimony trioxide is present in an amount which enhances the flame resistance provided by the phosphorus-containing flame retardant.

4,216,139

VINYL CHLORIDE POLYMERS CONTAINING COPPER OXALATE

Arthur W. McRowe, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 648,277, Jan. 12, 1973, abandoned, and a continuation of Ser. No. 833,865, Nov. 16, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,643
Int. Cl.[2] C08K *5/09*
U.S. Cl. 260—45.75 C **5 Claims**

1. A composition comprising a vinyl chloride polymer and copper oxalate in amounts from about 0.01 to about 20 weight parts per 100 weight parts of vinyl chloride polymer and less than 0.005 weight percent of iron powder based on the weight of said composition and a ratio of less than one weight part of iron powder per 99 weight parts of copper oxalate.

4,216,140

ROOM TEMPERATURE VULCANIZABLE POLYORGANOSILOXANE COMPOSITION

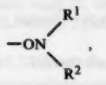
Chiyuki Simizu, Oota, Japan, assignor to Toshiba Silicone Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,580
Claims priority, application Japan, Dec. 28, 1977, 52-159979
Int. Cl.[2] C08K *3/10*
U.S. Cl. 260—45.75 R **12 Claims**

1. A room temperature vulcanizable polyorganosiloxane composition comprising:

(A) 100 parts by weight of polydiorganosiloxane component having a viscosity of from 100 to 1,000,000 cSt at 25° C. and wherein from 0.1 to 25 mole percent of the total organo groups are phenyl groups, said polydiorganosiloxane component being selected from the group consisting of (1) silanol-terminated polydiorganosiloxane and (2) a mixture of (a) more than 60 weight percent of silanol-terminated polydiorganosiloxane and the balance is (b) triorganosilyl group-terminated polydiorganosiloxane,

(B) 0.1 to 50 parts by weight of substituted aminoxy group-containing organosilicon component, said substituted aminoxy group having the formula



wherein R^1 and R^2 each is a monovalent hydrocarbon group, or the formula

wherein R^3 is a divalent organic group, said substituted aminoxy group-containing organosilicon component having more than two of said substituted aminoxy groups bonded to a silicon atom or silicon atoms, on the average, per molecule,

(C) 75 to 300 parts by weight of aluminum hydroxide powder having a particle size of less than 50 microns, and

(D) 0.000001 to 0.005 parts by weight, calculated as platinum metal, of platinum metal, platinum compound or mixture thereof.

4,216,141

METHOD FOR CYCLIZATION OF PEPTIDES

Jean E. F. Rivier, La Jolla, and Robert F. Galyean, San Marcos, both of Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation of Ser. No. 798,441, May 23, 1977, abandoned. This application Jul. 19, 1978, Ser. No. 926,491
Int. Cl.[2] C07C *103/52, 149/00*
U.S. Cl. 260—112.5 R **12 Claims**

1. A method for forming a disulfide bridge in peptides containing at least one pair of cysteine moieties comprising preparing a solution of a peptide containing at least one pair of cysteine moieties, preparing a solution of an oxidizing agent, adding said peptide solution in increments to said solution of oxidizing agent, monitoring the pH of the reaction mixture comprising the solution of oxidizing agent and the increment of the peptide solution and maintaining the pH of the reaction mixture at a level of from about 6 to about 8, the period between addition and the size of said increments being such that the oxidizing reaction to form the disulfide bond occurs substantially instantaneously and the sulfhydryl concentration during the reaction remains substantially constant and at a level of substantially zero.

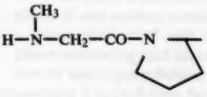
4,216,142

CHROMOGENIC SUBSTRATES FOR THE PROTEOLYTIC ENZYMES

Akhtar Ali, Vernon Hills, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 18, 1978, Ser. No. 970,767
Int. Cl.[2] C07C *103/52*; C12K *1/04*
U.S. Cl. 260—112.5 R **1 Claim**

1. A compound which is



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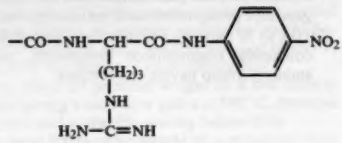


and the hydrochloride salt thereof.

4,216,143

SOLUBLE NON-FERROUS METAL PROTEINATES

Harvey H. Ashmead, P.O. Box 750, Clearfield, Utah 84015

Filed Oct. 20, 1977, Ser. No. 843,969

Int. Cl.[2] C07G *7/04*

U.S. Cl. 260—113 **5 Claims**

1. A metal proteinate wherein the metal is selected from the group consisting of zinc, copper, manganese, magnesium and calcium or mixtures thereof having a water solubility sufficient to provide an aqueous solution containing at least five percent by weight metal at ambient temperature at a pH of between about 7 and 8 comprising a metal ion in coordination complex with at least two protein hydrolysate ligands selected from the group consisting of polypeptides, peptides and naturally occurring amino acids wherein at least one of the ligands contains an amino group having an excess proton.

4,216,144

SOLUBLE IRON PROTEINATES

Harvey H. Ashmead, P.O. Box 750, Clearfield, Utah 84015

Filed Oct. 20, 1977, Ser. No. 843,972

Int. Cl.[2] C07G *7/04*

U.S. Cl. 260—115 **4 Claims**

1. An iron proteinate having a water solubility sufficient to provide an aqueous solution containing at least five precent by weight iron at ambient temperatures at a pH of between about 7 and 8 comprising an iron ion in co-ordination complex with at least three protein hydrolysate ligands selected from the group consisting of polypeptides, peptides and naturally occurring amino acids wherein at least one of the ligands contains an amino group having an excess proton.

4,216,145

WATER-INSOLUBLE MONO-AZO YELLOW DYES DERIVED FROM 1-PHENYL-3-AMINOPYRAZOLES

Ruggero Battisti; Gioacchino Boffa; Nicola Mazzaferro, all of Novara; Angelo Mangini, and Antonio Tundo, both of Bologna, all of Italy, assignors to Montedison S.p.A., Milan, Italy

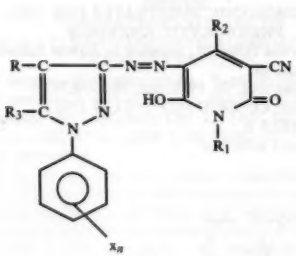
Filed Jun. 24, 1977, Ser. No. 809,848

Claims priority, application Italy, Jun. 25, 1976, 24717 A/76

Int. Cl.[2] C07B *29/34*

U.S. Cl. 260—156 **14 Claims**

1. A water-soluble yellow monoazo dye, having the formula:



(I)

in which

R is H or CH_3;

R_1 is CH_3 or C_2H_5;

R_2 is CH_3, C_2H_5, or C_3H_7;

R_3 is H or phenyl;

X is H, Br, Cl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, carboxyalkyl of 1 to 4 carbon atoms, CF_3 or CN; and

n is 1, 2 or 3.

4,216,146

AZO(HYDRAZO)-ANTHRAQUINONE COMPOUNDS

Rainer Kitzing, Ingatestone; Brian R. D. Whitear, Brentwood; William E. Long, Brentwood; David L. R. Reeves, Brentwood, and Glenn P. Wood, Brentwood, all of England, assignors to Ciba-Geigy AG, Basel, Switzerland

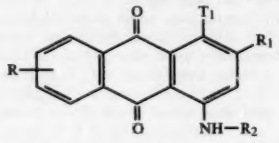
Filed Feb. 23, 1979, Ser. No. 14,779

Claims priority, application United Kingdom, Feb. 28, 1978, 07785/78

Int. Cl.[2] C07C *29/10, 29/36, 97/24*

U.S. Cl. 260—202 **13 Claims**

1. An azo(hydroazo-anthraquinone compound of the formula



where R is hydrogen or at least one substituent, T_1 is a hydrogen, an hydroxy or alkoxy group or an amino or substituted amino group, R_1 is hydrogen, halogen, an alkoxy, an amino or substituted amino group, an aryl or substituted aryl group, or a group conferring solubility in water and R_2 is a group which comprises an azo linkage and a ballasting group or is a group which completes the hydrazo link and which comprises a ballasting group.

4,216,147

N-METHYL-N-(SUBSTITUTED CARBONYLAMINOTHIO)CARBAMATES

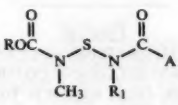
Anthony D. Wolf, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 2, 1978, Ser. No. 957,231

Int. Cl.[2] C09B *29/14*

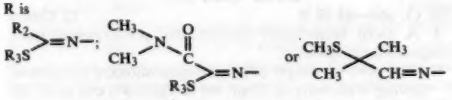
U.S. Cl. 260—267 **10 Claims**

1. A compound of the formula



wherein

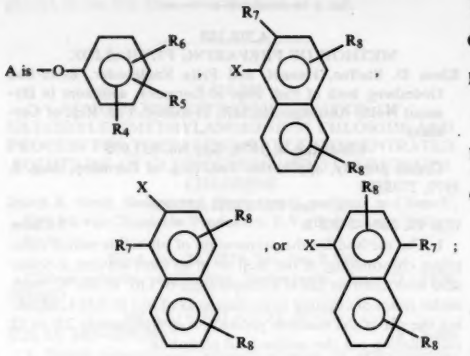
R is



where

R_1 and R_3 are C_1–C_3 alkyl;

R_2 is C_1–C_3 alkyl or CH_3OCH_2; and



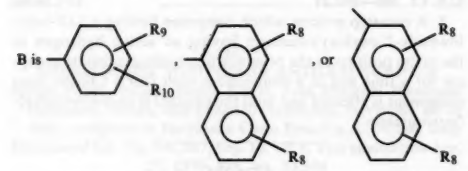
where

R_4 and R_5 are H, C_1–C_4 alkyl, halogen, $—CO_2H$ or $—SO_3Na$;

R_6 is o or p —N=N—B;

R_7 is —N=N—B;

R_8 is H or SO_3Na;



where

R_9 and R_{10} are H, C_1–C_4 alkyl, halogen, $—CO_2H$, $—SO_3Na$, NO_2, or C_1–C_3 alkoxy; and

X is NH or O.

4,216,148

4H-THIENO[3,4-B][1,4]BENZODIAZEPINES

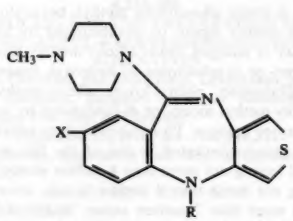
Corris M. Hofmann, Ho-Ho-Kus, N.J.; Jeffery B. Press, Bellvale, N.Y., and Sidney R. Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 30, 1979, Ser. No. 7,853

Int. Cl.³ C07D *495/04;* A61K *31/495*

U.S. Cl. 260—243.3 **7 Claims**

1. A compound selected from the group consisting of those of the formula:



wherein X is hydrogen, fluoro or chloro and R is hydrogen or methyl; and the pharmacologically acceptable acid-addition salts thereof.

4,216,149

DL-N-(4,5,6,7-TETRAHYDRO-7-OXOBENZO[B]THIEN-4-YL)PHTHALIMIDE

Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 816,429, Jul. 18, 1977, Pat. No. 4,134,899, which is a continuation of Ser. No. 628,716, Nov. 4, 1975, abandoned. This application Aug. 23, 1978, Ser. No. 936,319

Int. Cl.² C07D *333/54*

U.S. Cl. 260—326 S **1 Claim**

1. The compund dl-N-(4,5,6,7-tetrahydro-7-oxobenzo[b]thien-4-yl)phthalimide.

4,216,150

PREPARATION OF PYRROLE-2-ACETATES

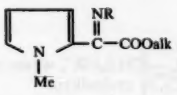
John R. Carson; Richard J. Carmosin, both of Norristown, and Anthony T. Stefanski, Bethlehem, all of Pa., assignors to McNeil Lab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 789,310, Apr. 20, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,559

Int. Cl.² C07D *207/32*

U.S. Cl. 260—326.2 **16 Claims**

1. A process of preparing a loweralkyl 1-methylpyrrole-2-acetate which comprises reducing a loweralkyl α-imino-1-methylpyrrole-2-acetate having the formula:



wherein:

alk is loweralkyl; and

R is a member selected from the group consisting of hydrogen, loweralkyl, cyclopentyl, cyclohexyl, phenyl and phenyl substituted with from one to three substituents each selected from the group consisting of loweralkyl, loweralkyloxy and halo;

by the action of a divalent sulfur reducing agent selected from the group consisting of hydrogen sulfide, an alkali metal hydrogen sulfide, sodium polysulfide and ammonium polysulfide.

4,216,151

PROCESS FOR THE RECOVERY OF 2-PYRROLIDONE

Reijer Goettsch, Beek, and Arnold G. M. Jetten, Moorveld, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Nov. 28, 1978, Ser. No. 964,790

Claims priority, application Netherlands, Dec. 2, 1977, 7713349

Int. Cl.² C07D *207/26*

U.S. Cl. 260—326.5 FN **12 Claims**

1. A process for the recovery of 2-pyrrolidone from an aqueous solution of the reaction product formed by the hydrogenation of succinonitrile and subsequent reaction of the hydrogenation product thus obtained with water, said aqueous solution containing 2-pyrrolidone and impurities, said process essentially comprising the steps of:

adjusting said aqueous solution of a pH value of at most 7;

extracting said pH adjusted aqueous solution with an organic solvent selected from the group consisting of chloroform and methylene chloride, thereby forming a first organic phase of said solvent consisting 2-pyrrolidone and at most a minor portion of said impurities, and a first aqueous phase containing said impurities and at most a minor portion of said 2-pyrrolidone;

recovering 2-pyrrolidone from said first organic phase.

4,216,152
PROCESS FOR MAKING N-(N'-METHYLENEPYRROLIDONYL)-2-SUBSTITUTED ANILINES

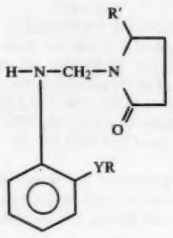
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 892,146, Mar. 31, 1978, and Ser. No. 955,483, Oct. 27, 1978. This application Dec. 14, 1978, Ser. No. 969,360

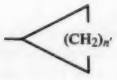
Int. Cl.[2] A01N *9/22;* C07D *207/26*

U.S. Cl. 260—326.5 S 3 Claims

1. A process for making N-(N'-methylenepyrrolidonyl)-2-substituted aniline intermediate compounds in high yield having the formula:

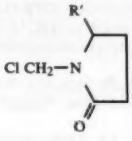


where R is
alkyl, C_1–C_6,
alkenyl, C_3–C_5,
alkyleneoxyalkyl, $-(CH_2)_nOR''$, where n=1–3, and
R'' is alkyl, C_1–C_3, or cycloalkyl,

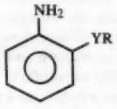


where n'=0–3,
R' is hydrogen or alkyl, C_1–C_3, and,
Y is oxygen or sulfur,
which consists of:

(a) forming a mixture containing substantially equivalent molar amounts of a chloromethylpyrrolidone having the formula:



and a 2-substituted aniline having the formula:



by adding said chloromethylpyrrolidone to said 2-substituted aniline at a temperature of about 5° C. or less, at atmospheric pressure, in an aromatic hydrocarbon solvent, in the presence of an acid acceptor, and

(b) warming said mixture to about room temperature

(c) reacting said reactants until alkylation is substantially complete, and,

(d) crystallizing the product from the resulting solution.

4,216,153
METHOD OF PREPARING PHTHALIDE

Klaus D. Steffen, Hennef, and Fritz Englaender, Bonn-Bad Godesberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,075

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735503

Int. Cl.[2] C07D *307/88*

U.S. Cl. 260—343.3 R 1 Claim

1. The method for the preparation of phthalide which comprises chlorinating, in the melt or in an inert solvent, o-toluic acid with chlorine gas at a temperature of 110° to 260° C. with molar ratios of chlorine to o-toluic acid of (0.1 to 0.5):1, adjusting the pH of the reaction product to approximately 7.0 to 12 and filtering out the undissolved phthalide.

4,216,154
PROCESS FOR MAKING α-LOWERALKYLFUROCOUMARINS

Kurt D. Kaufman, Kalamazoo, Mich., assignor to Thomas C. Elder, Inc., Hamilton, Ind.

Filed Mar. 15, 1979, Ser. No. 20,935

Int. Cl.[2] C07D *493/04*

U.S. Cl. 260—343.21 15 Claims

1. A one-step process which comprises heating a 7-(2'-halo-loweralk-2'-enyloxy)coumarin having an active hydrogen in the ortho position in the presence of a hydrogen halide acceptor for a time and at a temperature such that a Claisen rearrangement is effected and until the product is an α-loweralkylfurocoumarin.

4,216,155
PROCESS FOR THE PREPARATION OF NOVEL BENZOPYRANE DERIVATIVES

Georges Haas, Binningen; Alberto Rossi, Oberwil; Knut A. Jaeggi, Basel, and Alex Sele, Muttenz, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

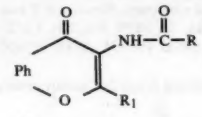
Filed Jul. 11, 1978, Ser. No. 923,522

Claims priority, application Luxembourg, Jul. 15, 1977, 77786

Int. Cl.[2] C07D *311/22;* A61K *31/35;* C07D *311/78, 493/04*

U.S. Cl. 260—345.2 3 Claims

1. A 3-glycoloylamino-4-oxo-4H-1-benzopyrane derivative of the formula I'



(I')

wherein R is lower alkanoyloxy methyl, benzoyloxy methyl, benzoyloxy methyl mono- or di-substituted by lower alkyl, lower alkoxy or halogen, lower alkoxy-methyl, lower alkoxy-methyl mono- or di-substituted by hydroxyl, lower alkoxy or di-lower alkylamino, phenyl-lower alkoxy-methyl, phenyl-lower alkoxy-methyl mono- or di-substituted by lower alkyl, lower alkoxy or halogen; Ph is 1,2-phenylene which is unsubstituted or mono-substituted in one of the free positions by lower alkyl having not more than 4 carbon atoms, lower alkoxy having not more than 4 carbon atoms, lower alkanoyl having not more than 7 carbon atoms, hydroxyl or halogen with an atomic number of not more than 35 or is disubstituted on two adjacent free positions by 3-membered or 4-membered lower alkylene having not more than 4 carbon atoms or 3-membered or 4-membered lower alkylenedioxy, and R_1 is

hydrogen, lower alkyl having not more than 4 carbon atoms or phenyl, in the free form or in the form of a salt.

4,216,156

STABLE CONCENTRATED SOLUTION OF GLYCIDYLTRIMETHYLAMMONIUM CHLORIDE AND PROCESS FOR PREPARING STABLE CONCENTRATED SOLUTIONS OF GLYCIDYLTRIMETHYLAMMONIUM CHLORIDE

Jacob K. Smid, Bodegraven, Netherlands, assignor to Chem-Y, Fabriek van Chemische Produkten, B.V., Bodegraven, Netherlands

Filed Jan. 22, 1979, Ser. No. 5,589

Claims priority, application Netherlands, Jan. 27, 1978, 7801007

Int. Cl.[2] C07D *301/34, 303/36*

U.S. Cl. 260—348.38 **5 Claims**

1. Stable concentrated aqueous solution of glycidyltrimethylammonium chloride, said solution containing the monohydrate of glycidyltrimethylammonium chloride in a concentration of 90% to saturation and after dilution with water to a content of 25% glycidyltrimethylammonium chloride shows a pH of less than 12.5.

5. The monohydrate of glycidyltrimethylammonium chloride.

4,216,157

SUBSTITUTED ANTITUMOR ANTHRACYCLINES

Sergio Penco, Milan; Fausto Gozzi, Zola Predosa; Francesco Angelucci, Milan, and Federico Arcamone, Nerviano, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

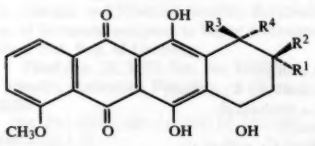
Division of Ser. No. 941,847, Sep. 13, 1978. This application Apr. 27, 1979, Ser. No. 33,994

Claims priority, application Italy, May 9, 1978, 23151 A/78

Int. Cl.[2] C07C *49/72*

U.S. Cl. 260—365 **2 Claims**

1. A compound of the formula:



wherein R^1 is OH; R^2 is $COCH_3$; R^3 is OCH_3 and R^4 is H; or R^1 is $COCH_3$; R^2 is OH; R^3 is H and R^4 is OCH_3.

4,216,158

PROCESS FOR THE PREPARATION OF 2,6-Di-TERT.-ALKYL-4-ALKYLIDENE-2,5-CYCLOHEXADIEN-ONES

Ernst Roos, Odenthal, and Erika Hugl, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

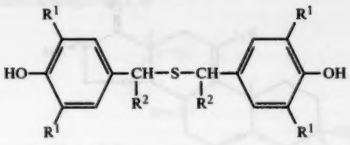
Filed Jul. 13, 1978, Ser. No. 924,311

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734239

Int. Cl.[2] C07C *45/16, 49/62*

U.S. Cl. 260—396 N **6 Claims**

1. A process for preparing a 2,6-di-tert.-alkyl-4-alkylidene-2,5-cyclohexadien-one which comprises contacting at a temperature in the range of from 50° to 200° C. a bis-(3,5-di-tert.-alkyl-4-hydroxybenzyl)sulphide of the formula



wherein

R^1 denotes a tertiary alkyl group and

R^2 denotes hydrogen, a straight or branched alkyl, cycloalkyl, cycloalkanyl, aralkyl or aryl group with lead or mercury in the oxide, hydroxide, carbonate, acetate or other basic reacting salt form in an inert solvent.

4,216,159

SYNTHESIS OF 16-UNSATURATED PREGNANES FROM 17-KETO STEROIDS

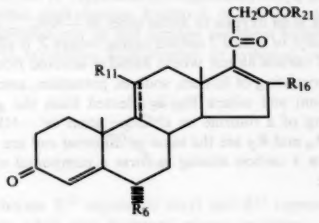
Edward J. Hessler, Kalamazoo, and Verlan H. VanRheenen, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed May 25, 1978, Ser. No. 909,349

Int. Cl.[2] C07J *9/00, 1/00*

U.S. Cl. 260—397.1 **118 Claims**

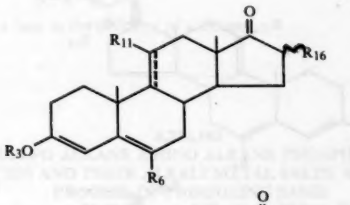
1. A process for preparation of a compound of the formula:



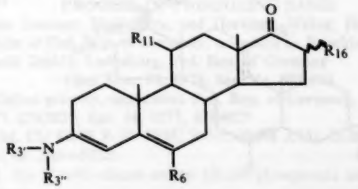
Va

where R_6 is a hydrogen or fluorine atom or methyl group; where R_{11} is a hydrogen atom, α—OR_{11a} or β—OR_{11a}; where R_{11a} is a hydrogen atom or TMS with the proviso that when R_{11} is —OR_{11a}, ---in ring C is a single bond; where R_{16} is a hydrogen atom or methyl group; where R_{21} is alkyl of 1 thru 5 carbon atoms or phenyl and where ---is a single or double bond which comprises:

(1) reacting a compound of the formula:



IIa,

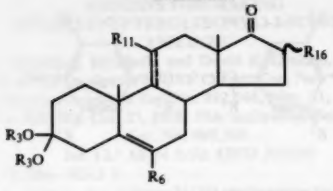


IIb

or

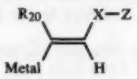
-continued

IIc

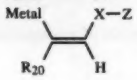


where R_3 is alkyl of 1 thru 5 carbon atoms; with the proviso that with the ketal the R_3 groups can be connected to form the ethylene ketal; where $R_{3'}$ and $R_{3''}$ are the same or different and are alkyl of 1 thru 5 carbon atoms; and where ~ indicates R_{16} is in either the α or β configuration, with a metalated olefin selected from the group consisting of a cis-trans mixture (VIa and VIb) or trans (VIb) compounds of the formula:

VIa

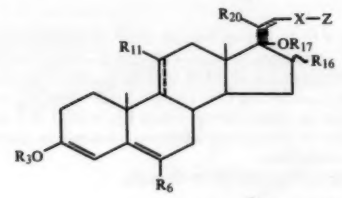


VIb

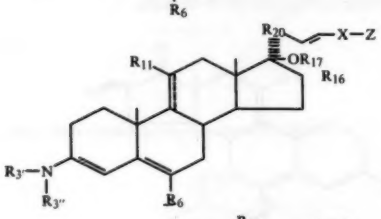


where X is an oxygen or sulfur atom or $-NR_\eta-$; where R_η is alkyl or 1 thru 3 carbon atoms; where Z is alkyl of 1 thru 5 carbon atoms; where Metal is selected from the group consisting of lithium, sodium, potassium, zinc, and magnesium and where R_{20} is selected from the group consisting of a fluorine or chlorine atom or $-NR_\alpha R_\beta$ where R_α and R_β are the same or different and are alkyl of 1 thru 3 carbon atoms; to form a compound of the formula:

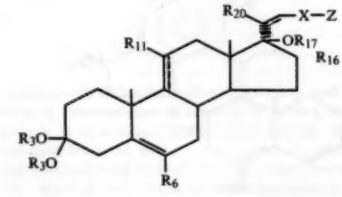
IIIa



IIIb

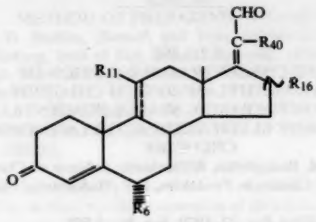


IIIc



(2) acid hydrolysis of the olefin (IIIa–IIIc) to form a 21-aldehyde (IVa) of the formula:

IVa



and

(3) reaction of the 21-aldehyde (IVa) with a compound of the formula $R_{21}CO_2\ominus$ in an aprotic diluent.

4,216,160

SUBSTITUTED MERCAPTO ACID AMIDES AND THEIR USE

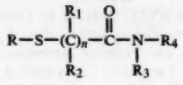
Conrad P. Dorn, Plainfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 844,960, Oct. 25, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 939,293

Int. Cl.[2] **C07C** *153/09, 103/32*

U.S. Cl. 260—455 R **7 Claims**

1. A compound of structural formula:



n is 1 to 4;

R is (a) hydrogen;

(b)

where

R_5 is

(1) C_{1-4} alkyl;

(2) C_{1-4} alkoxy C_{1-4} alkyl;

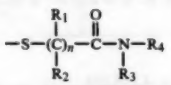
(3) C_{3-6} cycloalkyl;

(4) phenyl;

(5) phenyl C_{1-4} alkyl; or

(6) C_{1-4} alkoxycarbonyl C_{1-4} alkyl;

(c)



R_1 and R_2 may be the same or different and are independently selected from

(a) hydrogen; and

(b) C_{1-4} alkyl; and

R_3 and R_4 may be the same or different and are independently selected from

(a) hydrogen;

(b) C_{1-4} alkyl; and

(c)

where

R_5 is
(1) C_{1-4} alkyl;
(2) C_{1-4} alkoxy C_{1-4} alkyl;
(3) C_{3-6} cycloalkyl;
(4) phenyl;
(5) phenyl C_{1-4} alkyl; or
(6) C_{1-4} alkoxycarbonyl C_{1-4} alkyl;
provided that, with regard to all of the above substituents, at least one carbonyl-containing group is selected.

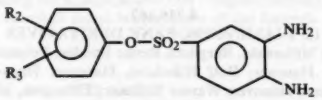
4,216,161

3,4-DIAMINOPHENYL SULFONIC ACID ESTERS

Heinz Loewe, Kelkheim; Josef Urbanietz, Schawalbach; Dieter Düwel, Hofheim, and Reinhard Kirsch, Niederjosbach, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Division of Ser. No. 608,014, Aug. 26, 1975, Pat. No. 3,996,369.
This application Apr. 23, 1976, Ser. No. 679,783
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1974, 2441202
Int. Cl.[2] C07C *143/68*
U.S. Cl. 260—456 A **1 Claim**

1. A compound of the formula



in which R_2 and R_3, independently of each other, each stands for hydrogen, hydroxy, alkoxy or 1 to 4 carbon atoms, halogen, trifluoromethyl, alkyl of 1 to 4 carbon atoms, carbalkoxy of 1 to 4 carbon atoms in the alkoxy moiety, or cyano.

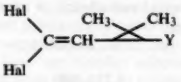
4,216,162

NOVEL DERIVATIVES OF CYCLOPROPANECARBOXYLIC ACID USEFUL AS INTERMEDIATES FOR THE PREPARATION OF INSECTICIDES

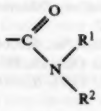
Dieter Arlt, Cologne, and Manfred Jautelat, Burscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 920,031
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1977, 2732213
Int. Cl.[2] C07C *151/11, 103/19, 153/063*
U.S. Cl. 260—500.5 H **14 Claims**

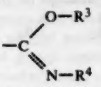
1. A 2-(2,2-dihalogenovinyl)-3,3-dimethylcyclopropanecarboxylic acid derivative of the formula



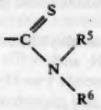
in which
Hal each independently is halogen, and
Y is

(a)


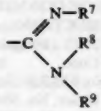
wherein R^1 represents hydrogen, alkyl, or aryl and R^2 represents hydrogen, alkyl, aryl, hydroxyl, alkoxy, amino, alkylamino, dialkylamino, acyl, alkoxycarbonyl, or aminocarbonyl, or Y is

(b)


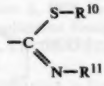
wherein R^3 and R^4 independently of one another represent hydrogen, alkyl, aryl, or acyl, or Y is

(c)


wherein R^5 and R^6 independently of one another represent hydrogen, aryl, hydroxyl, alkoxy, or amino, or Y is

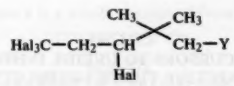
(d)


wherein R^7 represents hydrogen, alkyl, aryl, amino, alkylamino, dialkylamino, hydroxyl, or alkoxy and R^8 and R^9 independently of one another represent hydrogen, alkyl, aryl, arylamino, dialkylamino, or hydroxyl, or Y is

(e)


wherein R^{10} represents alkyl and R^{11} represents hydrogen, alkyl, aryl, hydroxyl, alkoxy, or amino.

8. A process for the preparation of a 2-(2,2-dihalogenovinyl)-3,3-dimethylcyclopropanecarboxylic acid derivative according to claim 1, comprising reacting a compound of the formula



with a base in the presence of a diluent.

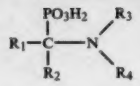
4,216,163

N-SULFO ALKANE AMINO ALKANE PHOSPHORIC ACIDS AND THEIR ALKALI METAL SALTS, AND A PROCESS OF PRODUCING SAME

Klaus Sommer, Heidelberg, and Hermann Weber, Hemsbach, both of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Ladenburg, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,043
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713827; Apr. 14, 1977, 2716417
Int. Cl.[2] C07F *9/38*; C14C *9/00*; D06M *1/00*; C02B *5/06*
U.S. Cl. 260—502.5 **10 Claims**

1. An N-sulfo alkane amino alkane phosphonic acid of the formula



in which

R_1 indicates hydrogen, alkyl with 1 to 11 carbon atoms, aryl, amino lower alkylene, or a lower alkylene phosphonic acid group;

R_2 indicates the phosphonic acid group;

R_3 indicates an alkylene sulfonic acid group of the formula $C_nH_{2n}SO_3H$;

R_4 indicates hydrogen or an alkylene sulfonic acid group of the formula $C_nH_{2n}SO_3H$; and

n indicates one of the numerals 1 to 11;

and the alkali metal salts of said phosphonic acids.

4,216,164

UREIDE INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

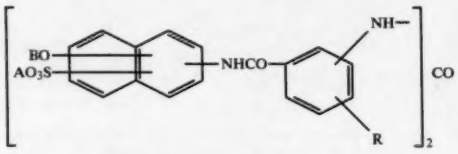
Seymour Bernstein, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 833,319, Sep. 14, 1977, Pat. No. 4,131,684, which is a division of Ser. No. 684,601, May 10, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,174

Int. Cl.[2] **C07C** *143/48, 69/14*

U.S. Cl. 260—506 **9 Claims**

1. A compound selected from those of the formula:



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower (C_1–C_6) alkanoyl or alkali metal; and R is hydrogen.

4,216,165

AMINE PRECURSORS TO UREIDE INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

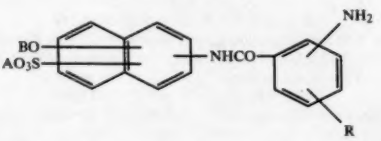
Seymour Bernstein, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 833,319, Sep. 14, 1977, Pat. No. 4,131,684, which is a division of Ser. No. 684,601, May 10, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,172

Int. Cl.[2] **C07C** *143/48, 69/14*

U.S. Cl. 260—507 R **7 Claims**

1. A compound selected from those of the formula:



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower (C_1–C_6) alkanoyl or alkali metal; and R is hydrogen.

4,216,166

NITRO PRECURSORS TO AMINE PRECURSORS TO UREIDE INHIBITORS OF CONNECTIVE TISSUE DESTRUCTION

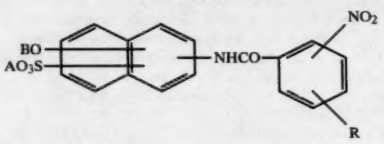
Seymour Bernstein, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 833,319, Sep. 14, 1977, Pat. No. 4,131,684, which is a division of Ser. No. 684,601, May 10, 1976, abandoned. This application Dec. 20, 1978, Ser. No. 971,173

Int. Cl.[2] **C07C** *143/48, 69/14*

U.S. Cl. 260—507 R **7 Claims**

1. A compound selected from those of the formula:



wherein A is hydrogen or a pharmaceutically acceptable salt cation; B is hydrogen, lower (C_1–C_6) alkanoyl or alkali metal; and R is hydrogen.

4,216,167

1,3 DIAMINOPROPANE DERIVATIVES

Wolfgang Milkowski, Burgdorf; Renke Budden, Peine; Siegfried Funke, Hanover; Rolf Hüschens, Hanover; Hans-Günther Liepmann, Hanover; Werner Stühmer, Eldsagsen, and Horst Zeugner, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

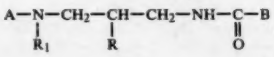
Continuation-in-part of Ser. No. 558,969, Jun. 20, 1975, abandoned, which is a continuation-in-part of Ser. No. 355,987, May 3, 1973, abandoned, and a continuation-in-part of Ser. No. 355,986, May 1, 1973, Pat. No. 3,998,809. This application Oct. 4, 1976, Ser. No. 729,142

Claims priority, application Fed. Rep. of Germany, May 3, 1972, 2221558

Int. Cl.[2] **C07C** *103/74, 103/75*

U.S. Cl. 260—558 D **19 Claims**

1. A 1,3-diaminopropane having the formula I



wherein R_1 is a member selected from the group consisting of hydrogen, lower alkyl, methoxyethyl, benzyl and cycloalkyl, R is hydroxy, A and B are each a member selected from the group of phenyl, phenyl substituted with 1 to 3 members of the group consisting of halogen, alkyl, alkoxy, nitro, trifluoromethyl, methylthioalkyl and alkoxy, or an acid addition salt of said diaminopropane.

4,216,168

PREPARATION OF HIGH PURITY TETRAHYDROCARBYLAMMONIUM TETRAHYDRIDOBORATES

Francis E. Evans, Hamburg; Charles J. Lind, Gowanda, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 855,145, Nov. 28, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,822

Int. Cl.[2] **C07C** *85/00*

U.S. Cl. 260—567.6 M **13 Claims**

1. The process for preparing high purity tetrahydrocarbylammonium tetrahydridoborates of the formula

$R_1R_2R_3R_4NBH_4$

wherein R_1, R_2, R_3 and R_4 may be independently selected from the group consisting of alkyl containing 1–6 carbon atoms, which comprises carrying out the following steps under anhydrous conditions and at temperatures from about 30° C. up to the boiling point of the reaction mixture:

(a) reacting a tetrahydrocarbylammonium salt starting material of the formula

$R_1R_2R_3R_4N^+X^-$

wherein R_1, R_2, R_3 and R_4 are as defined above and wherein X^- is an anion from an inorganic salt, with at least 8% molar excess of an alkali metal hydroxide of the formula

MOH

wherein M is an alkali metal, in the presence of anhydrous ethanol to produce a tetrahydrocarbylammonium hydroxide of the formula

$R_1R_2R_3R_4N^+OH^-$

wherein R_1, R_2, R_3 and R_4 are as defined above in solution with the ethanol, and the corresponding alkali metal salt,

(b) removing the alkali metal salt, and

(c) reacting the $R_1R_2R_3R_4N^+OH^-$ organic solvent solution with an alkali metal borohydride of the formula

M_1BH_4

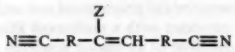
wherein M_1 is an alkali metal.

4,216,169
TWO-STAGE CATALYTIC HYDROGENATION OF OLEFINICALLY UNSATURATED DINITRILES

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 27, 1978, Ser. No. 946,231
Int. Cl.² C07C *85/12*
U.S. Cl. 260—583 P **24 Claims**

1. A process for the catalytic hydrogenation of an olefinically unsaturated dinitrile feedstock comprising at least one unsaturated dinitrile compound of the formula



wherein each R is independently selected from the group consisting of alkylene radicals and alkylidene radicals, Z is an alkyl radical, and the number of carbon atoms in said compound is in the range from 7 to 30; which process comprises:

(a) contacting said feedstock in a first stage reaction zone with hydrogen, a first diluent and a first catalyst under suitable first stage hydrogenation conditions to thereby effect the at least substantially complete hydrogenation of the olefinic unsaturation of said compound, said diluent comprising at least one member selected from the group consisting of alkanols having 1 to 3 carbon atoms, said first catalyst comprising at least one catalytic component selected from the group consisting of elemental palladium, compounds of palladium which are reducible by hydrogen to elemental palladium at said suitable first stage hydrogenation conditions and mixtures of any two or more thereof, so as to form a first reaction effluent;

(b) removing said first diluent from said thus formed first reaction effluent so as to form an intermediate dinitrile product at least substantially free of olefinic unsaturation and at least substantially free of said alkanols;

(c) contacting said thus formed intermediate dinitrile product in a second stage reaction zone with hydrogen, a second diluent, and a second catalyst under suitable second reaction conditions to thereby effect the at least substantially complete conversion of the nitrile groups in said intermediate dinitrile product to primary amine groups; said second diluent being at least substantially free of any component having an adverse effect on the hydrogenation of said nitrile groups and being composed of from about 60 to about 100 weight percent of at least one member selected from the group consisting of ammonia, primary alkyl amines, secondary alkyl amines, tertiary alkyl amines and mixtures of any two or more thereof, based on total second diluent; and said second catalyst comprising at least one unsupported catalytic component selected from the group consisting of elemental cobalt, compounds of cobalt which are reducible by hydrogen to elemental cobalt at said suitable second stage reaction conditions, and mixtures of any two or more thereof, so as to form a second reaction effluent.

4,216,170
TRIS(5-AMINO-3-THIA-PENTYL)AMINE AND METHOD OF PREPARING SAME

Gerard Soula, Meyzieu, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jan. 9, 1979, Ser. No. 2,239
Claims priority, application France, Jan. 11, 1978, 78 00624
Int. Cl.² C07C *87/20*
U.S. Cl. 260—583 EE **1 Claim**

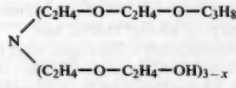
1. A novel industrial product, tris(5-amino-3-thia-pentyl)amine.

4,216,171
NOVEL COMPOSITIONS HAVING A BASE OF AMINOALKOXY AMINES

Gerard Soula, Meyzieu, and Joël Le Ludec, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 6, 1978, Ser. No. 957,925
Claims priority, application France, Nov. 21, 1977, 77 34846
Int. Cl.² C07C *89/00, 93/04*
U.S. Cl. 260—584 B **8 Claims**

1. A composition having a base of aminoalkoxy amines comprising at least one aminoalkoxy amine of the formula:



(I)

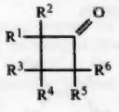
in which formula x is a whole number of from 1 to 3.

4,216,172
PREPARATION OF CYCLOBUTANONES

Hans-Georg Heine, and Willy Hartmann, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 13, 1978, Ser. No. 886,229
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715336
Int. Cl.² C07C *45/00, 45/02*
U.S. Cl. 568—364 **18 Claims**

1. A process for the preparation of a cyclobutanone of the formula



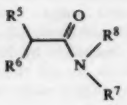
in which

R^1, R^2 and R^3 each independently is a hydrogen, halogen,

cyano, alkoxy, alkoxycarbonyl, N,N-dialkylaminocarbonyl, alkyl, aryl, aralkyl or alkenyl radical, and

R^4, R^5 and R^6 each independently is hydrogen, alkyl, haloalkyl, alkenyl, haloalkenyl, halogen, cyano, aralkyl or aryl, or any two of R^1 to R^6 together with the carbon atom to which each is linked for a ring,

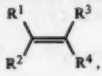
comprising reacting an N,N-disubstituted carboxylic acid amide of the formula



in which

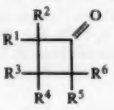
R^7 and R^8 each independently is an alkyl, cycloalkyl, alkenyl, aryl or aralkyl radical or together form a ring,

with an inorganic acid halide, then reacting the reaction mixture with a Lewis acid, then with a tertiary amine, and then with an olefin of the formula



and subsequently hydrolyzing the mass.

2. A process for the preparation of a cyclobutanone of the formula

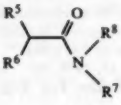


in which

R^1, R^2 and R^3 each independently is a hydrogen, halogen, cyano, alkoxy, alkoxycarbonyl, N,N-dialkylaminocarbonyl, alkyl, aryl, aralkyl or alkenyl radical, and

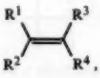
R^4, R^5 and R^6 each independently is hydrogen, alkyl haloalkyl, alkenyl, haloalkenyl, halogen, cyano, aralkyl or aryl, or any two of R^1 to R^6 together with the carbon atom to which each is linked form a ring.

comprising reacting an N,N-disubstituted carboxylic acid amide of the formula



in which

R^7 and R^8 each independently is an alkyl, cycloalkyl, alkenyl, aryl or aralkyl radical or together form a ring, with an inorganic acid halide, then reacting the reaction mixture with an amine, then in the presence of a Lewis acid with an olefin of the formula



and subsequently hydrolyzing the mass.

4,216,173

1,1-DICHLORO-4-METHYL-3-HYDROXY-PENT-1-ENE

Ernst Kysela, Bensberg; Reinhard Lantzsch, Cologne, and Erich Klauke, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 707,781, Jul. 22, 1976, abandoned. This application Jan. 29, 1979, Ser. No. 7,271

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1975, 2536503

Int. Cl.[2] **C07C** *11/20, 21/04*

U.S. Cl. 260—654 R **6 Claims**

1. A process for preparing 1,1-dichloro-4-methyl-penta-1,3-diene which comprises contacting 1,1-dichloro-4-methyl-3-hydroxy-pent-1-ene with a dehydrating agent under dehydration conditions.

4,216,174

METHOD AND APPARATUS FOR PREPARATION AND CONTROL OF AN AIR-FUEL MIXTURE

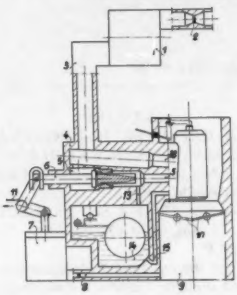
Ryszard Szott, and Ryszard Machnowski, both of Bielsko-Biala, Poland, assignors to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych "BOSMAL", Bielsko-Biala, Poland

Filed Dec. 26, 1978, Ser. No. 973,013

Claims priority, application Poland, Dec. 31, 1977, 203700

Int. Cl.[2] **F02M** *23/02*

U.S. Cl. 261—30 **11 Claims**



7. In an apparatus for the preparation and and control of an air-fuel mixture provided with a multistage atomizer installed in an air intake manifold of an engine upstream of the throttle thereof, a float chamber containing fuel connected to said multi-stage atomizer, means including a passage for supplying said multi-stage atomizer with a gas at a pressure higher than ambient pressure, said multi-stage atomizer including a diffuser at the end thereof opening towards the engine air intake manifold above the throttle whereat the mixture of fuel and gas is mixed with air induced by the engine to produce a charge for the engine cylinders, means for controlling the parameters of the gas supplied through the passage to the apparatus and a valve installed in said passage for correction of the flow parameters of the gas supplied to the multi-stage atomizer, said valve being pneumatically coupled with the air intake manifold downstream of the throttle to respond to negative pressure and being mechanically linked with the accelerator pedal in series with the throttle, said throttle comprising symmetrically opening elements having a shape co-operatively corresponding to the shape of the cross-section of the air intake manifold, said elements together forming an idling atomizer including, in series, a nozzle situated coaxially with the stream of flowing mixture, a port coaxially situated under said nozzle, and a staged nozzle for expanding the mixture, said multi-stage atomizer including a mechanical element whose flow parameters are constant, the fuel being induced and simultaneously being delivered at a continuous regulated pressure to side nozzles of said multi-stage atomizer from the float chamber, said float

chamber being connected through a further passage to the first said passage, wherein selected stages of said multi-stage atomizer are connected with the first said passage of said compressed gas, and other stages connected with the further passage through which a gas of other properties may be delivered, the improvement comprising:

a source of said gas which is compressed air, said source including a displacement pump driven by the engine, said displacement pump having recessess in a sliding surface for obtaining volumetrical characteristics proportional to the mass characteristic of the charge induced to the engine and for preventing pressure pulsation, said displacement pump being connected through a passage directly to an apparatus where said passage is divided into at least two passages for the compressed air, said first passage including a valve, and after said valve said first passage having a reduced portion, said first passage being connected with the float chamber upstream of said reduced portion, said first passage being connected with side nozzles of the multi-stage atomizer downstream of said reduced portion, said valve in said first passage being operated by a pneumatic actuator, said pneumatic actuator being connected to the air intake manifold downstream of the throttle, said valve being operatively connected to the accelerator pedal in series with the throttle to be opened by said pedal, said second passage being connected to a central nozzle which communicates through ducts to a concentric slot nozzle, said second passage also being connected to ejection ports connected to the side nozzles near the outlets thereof, said multi-stage atomizer including rotatably shaped elements and seals dividing said first and second passages and means in said second passage for varying the cross-section of the central nozzle, the latter said means including a needle threadably and resiliently mounted and coupled to a control cable for facilitating start of a cold engine.

4,216,175

CARBURETOR FOR COMBUSTION ENGINES

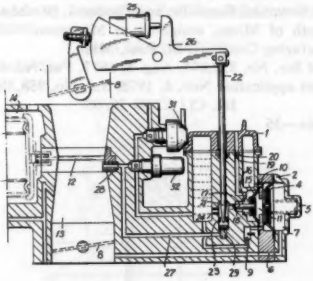
Walter Schauer, Neuss, Fed. Rep. of Germany, assignor to Firma Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Feb. 1, 1979, Ser. No. 8,396

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1978, 2807888

Int. Cl.[2] F02M *7/06*

U.S. Cl. 261—39 D **3 Claims**



1. A carburetor for combustion engines, comprising: an arbitrarily operated throttle valve located upstream and having air funnel means and a throttling element; enrichment means communicating with said throttling element and located downstream thereof for warm-up; said enrichment means having a fuel nozzle controlled by a needle; lever means and temperature sensing means, said needle having a varying position dependent on the position of said temperature sensing means through said lever means; fuel quantity being varied during acceleration by said throttling element for a predetermined time interval; pressure chamber means having fuel entrance means and fuel discharge means in form of a nozzle to a float chamber; two membranes bordering said pressure chamber; spring means for spring loading each of said membranes; one of said membranes having a plunger which opens and closes a bore communicating with said enrichment means upstream of said fuel nozzle; the other one of said membranes being actuatable dependent on the position of the throttle valve.

4,216,176

HUMIDIFIER

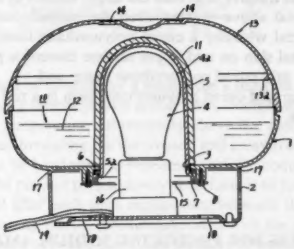
Hajimu Tanaka, 54-1-814, Mukogaoka 1-chome,, Toyonaka-shi, Osaka, Japan

Filed Oct. 30, 1978, Ser. No. 955,954

Claims priority, application Japan, Aug. 9, 1978, 53-097676; Aug. 9, 1978, 53-109961[U]

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—142 **3 Claims**



1. A humidifier comprising; an electric lamp, a protector in the form of a dome-shaped member made of heat resistant and light-transmitting material which surrounds the glass bulb of said electric lamp with a spacing therebetween and which has a lower open end provided with a large diameter portion with shoulder, an evaporation layer made of capillary substance in close contact with the outer surface of said protector to cover the same, an annual saucer which is capable of holding water and which has an opening at the middle of the bottom wall thereof through which the protector passes, a seal packing abutting against the shoulder of the protector and the lower surface of the bottom wall of the saucer at the periphery of the opening, pressing means for pressing the open end of the protector to the bottom wall of the saucer, and an ornamental cover provided with a vapor outlet and mounted on the saucer and covering the evaporation layer.

4,216,177

POLYURETHANE FOAM PRODUCT AND PROCESS OF MANUFACTURE THEREOF FROM THERMOSETTING FROTHED MIXTURE

Jeffrey B. Otto, Brooklyn, Conn., assignor to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 874,774, Feb. 3, 1978, abandoned, which is a continuation of Ser. No. 619,389, Oct. 3, 1975, abandoned. This application May 16, 1979, Ser. No. 39,451

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—25 **5 Claims**

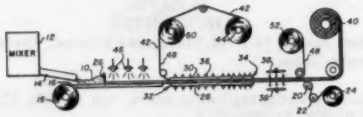
1. A continuous casting process for producing flexible polyurethane foam having an integral skin on at least one surface thereof including the steps of:

preparing a mechanically frothed mixture of a urethane foaming material;

depositing said mixture on a first surface of a movable support sheet and forming a layer of said material to a desired thickness;

preheating the upper surface of said doctored layer of material to at least partially gel said upper surface;

passing said preheated layer of material and the support sheet between a pair of spaced apart heating platens, one of said platens being in contact with the second surface of said support sheet and the other of said platens being spatially separated from the upper surface of said layer of material, to heat the upper surface of said layer by radiation and convection and to heat the lower surface of said layer by conduction;



independently controlling the temperatures of said platens to produce curing of said layer of material and to cause a rate of heat transfer to at least the upper surface of said layer of material above that required for normal curing of said material whereby a cured polyurethane foam having an integral skin on said upper surface thereof is produced;

cooling said cured polyurethane foam; and

taking up said cured polyurethane foam in a roll for storage or use.

4,216,178

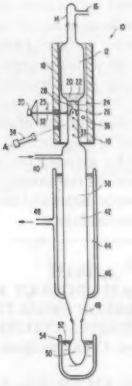
PROCESS FOR PRODUCING SODIUM AMALGAM PARTICLES

Scott Anderson, P.O. Box 2680, Champaign, Ill. 61820

Filed Feb. 2, 1976, Ser. No. 654,416

Int. Cl.[2] B01J *2/04*

U.S. Cl. 264—9 **15 Claims**



1. A method for producing free-flowing, discrete sodium-amalgam particles of controlled particle size and sodium oxide content less than 10 p.p.m. comprising:

heating a mixture of sodium and mercury in a vessel to form an amalgam melt of determinable unoxidized sodium content;

withdrawing a portion of said melt from the vessel at a point other than at an upper surface of said melt; and

passing the withdrawn portion of said melt through a vibrating discharge conduit into an inert, quenching atmosphere to form free-flowing, discreet particles of said amalgam.

4,216,179

PROCESS AND AN APPARATUS FOR THE CONTINUOUS MANUFACTURE OF BOARDS FROM MATERIAL INCORPORATING A HEAT HARDENABLE BINDER

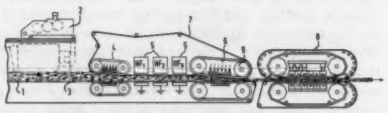
Kurt Lamberts; Jürgen Leppin, both of Clausthal-Zellerfeld; Berndt Greten, and Harry Neubauer, both of Springe, all of Fed. Rep. of Germany, assignors to Bison-werke Bähre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed May 12, 1978, Ser. No. 905,532

Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722356

Int. Cl.[2] H05B *1/00*

U.S. Cl. 264—25 **12 Claims**



1. A process for the continuous manufacture of particleboard comprising the steps of:

(a) forming a mat of lignocellulosic particles admixed with a heat hardenable binder binder in a forming station,

(b) forwarding said mat by endless belt means to a precompressor adapted to produce a precompressed mat of even level and reduced in thickness by approximately one third,

(c) forwarding the precompressed mat via the endless belt means to a high frequency energy preheating device for warming the mat to improve the compressibility thereof,

(d) forwarding the precompressed and warmed mat via the endless belt means to a further press for effecting a further pressing of the mat to reduce its thickness to substantially that of the required particleboard, said further pressing being effected at a pressure relatively high in relation to the pressure used in the precompressor and

(e) subsequently passing the compressed mat to a finishing press for consolidation into the final particleboard by the application of pressure and heat to harden the binder without substantial further reduction in thickness.

4,216,180

REINFORCING OR SEALING SOLID STRUCTURES OR FOR ANCHORING BOLTS THEREIN AND CARTRIDGES FOR USE IN SUCH METHOD

Ronald W. Seemann, Roseville, and Thomas I. Bradshaw, Shoreview, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 822,875, Aug. 8, 1977, Pat. No. 4,153,156. This application Nov. 6, 1978, Ser. No. 958,350

Int. Cl.[2] E21D *20/00*

U.S. Cl. 264—35 **2 Claims**

1. A process for sealing a hole, anchoring a rod or the like which comprises (a) inserting into a hole of a diameter from about 5 mm to 10 cm the components of a multi-part curable polymer system which is capable of curing to a hard resin, the

major components of said curable resin system being liquid, and a plurality of pressure fragmentable non-friable macrocapsules containing at least one part of a said multi-part curable polymer system, having a major dimension in the range of 4.75 mm to about 95% of the cross sectional diameter of said hole and being capable of forming flake-like fragments from the macrocapsule walls upon pressure fragmentation of the macrocapsules and release of the macrocapsule contents, (b) inserting a rod into said hole until the end thereof contacts said plurality of macrocapsules, (c) forcing the rod into said macrocapules so as to cause their fragmentation into flake-like fragments which serve as static mixers and cause turbulence and mixing of the released macrocapsule contents and hence initiate the curing of the multi-part curable system, and (d) permitting the curing to proceed to completion without rotation of said rod.

2. A process for sealing a hole, anchoring a rod or the like which comprises (a) inserting into a hole the components of a multi-part curable polymer system which are capable of curing to a hard resin, the major components of said curable resin system being liquid, and a sealing cartridge comprising a cylindrical array of pressure fragmentable non-friable macrocapsules in a fixed three dimensional relationship, said cylindrical array having a cross sectional diameter from 5 mm to 10 cm, said macrocapsules containing at least one part of said multi-part curable polymer system, having a major dimension in the range of 4.75 mm to about 95% of the cross sectional diameter of said cylindrical array and being capable of forming flake-like fragments from the walls of the macrocapsules upon their pressure fragmentation and release of their contents, (b) inserting a rod into said hole until the end thereof contacts the sealing cartridge, (c) forcing the rod into said cartridge so as to fragment said macrocapsules into flake-like fragments which serve as static mixers and cause turbulence and mixing of the released macrocapsule contents and hence initiate the curing of said multi-part curing system, and (d) permitting the curing reaction to proceed to completion without rotation of said rod.

4,216,181

PROCESS FOR APPLYING A LAYER OF A LIQUID FOAMABLE REACTION MIXTURE TO A CONTINUOUSLY MOVING SHAPING SUPPORT

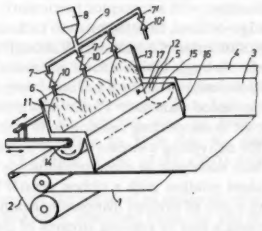
Wilfried Ebeling, Cologne; Volker Onnenberg, Wiel; Alberto C. Gonzalez-Dörner, Leverkusen; Bernd Lehmann, Cologne; Hansjürgen Rabe, and Klaus Schulte, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 812,011, Jul. 1, 1977, Pat. No. 4,165,211. This application Apr. 23, 1979, Ser. No. 32,090

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1976, 2631145

Int. Cl.² B29D *27/04*

U.S. Cl. 264—51 **3 Claims**



1. A process for the application of a layer of foamable liquid reaction mixture to a continuously moving support, comprising subjecting the reaction mixture to a preliminary distribution transversely to the direction of movement of the support and conveying said mixture to a place of intermediate storage in the form of a descending film, at least one side of which is exposed to the atmosphere and subsequently applying said mixture to said support in the liquid state.

4,216,182

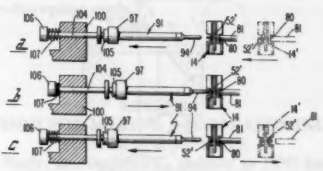
INFLATION MANIFOLD, METHOD OF AND APPARATUS FOR HEADING PLASTIC SAFETY PINS THEREIN

Glenn H. Mackal, Buena Vista Dr., Ringwood, N.J. 07456, and Edward A. Judd, 253 Fulton St., New Milford, N.J. 07646

Continuation of Ser. No. 558,244, Mar. 14, 1975, abandoned. This application Feb. 1, 1977, Ser. No. 764,598

Int. Cl.² B29C *24/00*

U.S. Cl. 264—71 **8 Claims**



1. A method of forming by a heated die a head on an end of a pin made of a thermoplastic acetal resin, comprising heating the die to a temperature substantially above the melting point of the pin, reciprocating the die toward and away from the end of the pin to be headed so as repeatedly briefly compressively to engage the pin and progressively to deform it to form a head thereon, and after each such engagement between the die and the pin removing the die from engagement with the pin before sticking occurs between them, the partially deformed portion of the pin cooling momentarily when the die is removed from engagement therewith.

5. A method of heading a thermoplastic pin inserted in a passage in a body, comprising supporting the body with the pin inserted therein with a first, unheaded end of the pin protruding from a first side of the body, heating a pin heading die above the melting point of the pin, mounting the die axially of the pin and confronting the first end of the pin, and reciprocating the heading die in the body and the pin inserted therein relatively toward and away from each other at a frequency of from 3 to 20 times a second so that the die alternately engages the first end of the pin and is withdrawn from engagement therewith, whereby the first end of the pin is repeatedly partially melted and compressed so that a head is progressively formed on said first end of the pin, the partially deformed portion of the pin cooling momentarily when the die is withdrawn from engagement therewith.

4,216,183

METHOD FOR MAKING FURNACE LINING

Ernst A. Siemssen, Gwynedd, Pa., assignor to Selas Corporation of America, Dresher, Pa.

Filed Aug. 22, 1975, Ser. No. 606,859

Int. Cl.² C04B *33/32, 35/16*

U.S. Cl. 264—80 **6 Claims**

1. In a method of preparing lightweight, erosion resistant elements having low heat inertia to be used as furnace lining, the steps comprising forming a rigid block of ceramic fiber material of a predetermined shape and thickness, said ceramic fiber material comprising alumina and silicon oxide, subjecting the surface of the block that is to face the furnace interior to the action of a high temperature flame, melting the ceramic fibers of a thin layer of said surface with said flame, and causing the melted thin layer of said surface to solidify into a smooth non-fibrous thin hard crust, said high temperature flame being at a temperature higher than any temperature to

which said surface is intended to be subjected when in use within said furnace.

4,216,184

METHOD OF INJECTION-MOULDING ONTO A PREFORMED WEB

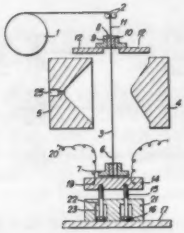
Berwyn C. Thomas, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Sep. 6, 1977, Ser. No. 830,768

Claims priority, application United Kingdom, Sep. 13, 1976, 37831/76

Int. Cl.[2] B29C *3/04, 5/00*; B29D *9/00*; B29F *1/00*

U.S. Cl. 264—229 **18 Claims**



1. A method for injection moulding plastics material onto a preformed web comprising

(a) advancing a free end of a length of web between separated male core and female cavity members of a mould until

a distal portion of the free end protrudes from the mould, and

a proximal portion of the free end, which has not advanced between the male core and female cavity members of the mould, is adjacent to the mould;

(b) releasably engaging tensioning means to the distal portion, wherein said tensioning means controls the tension in the free end and is free to move as the distal portion moves;

(c) holding against the tension only the proximal portion of the free end, leaving other portions of the free end capable of moving under tension in response to a movement of the male core relative to the female cavity which advances the male core into the female cavity in closing of the mould;

(d) advancing the male core into the female cavity to close the mould so causing the distal end to move under tension and with it the tensioning means while the proximal portion is held against the tension; and

(e) injecting plastics material onto the portion of the free end of the web which is between the male core and female cavity members of the mould.

4,216,185

METHOD AND APPARATUS FOR PURGING DISINFECTING HIGH PURITY WATER DISTRIBUTION SYSTEMS

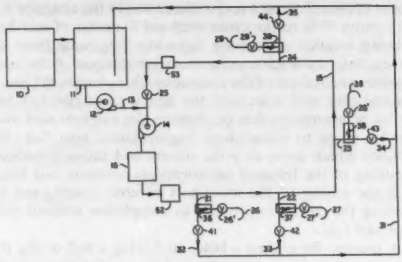
Dale W. Hopkins, P.O. Box 2611, New Bern, N.C. 28560

Continuation-in-part of Ser. No. 850,644, Nov. 11, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,714

Int. Cl.[2] A61L *1/00, 3/00, 13/06, 13/00*

U.S. Cl. 422—28 **19 Claims**

1. A method of purging high purity water distribution systems having a reservoir, a distribution loop communicatively connected with the reservoir, a treatment unit in the distribution loop, a plurality of branch lines and outlet faucets arranged along the distribution loop, means for continuously circulating fluid through the distribution loop and means for selectively drawing off fluid from the distribution loop through the branch lines and their outlet faucets, said method comprising the additional step of selectively intermittently



purging fluid from the branch lines independently of their outlet faucets.

4,216,186

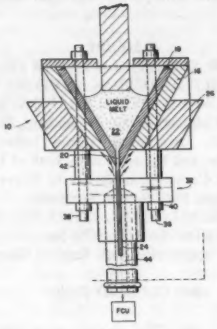
MEANS FOR GROWING RIBBON CRYSTALS WITHOUT SUBJECTING THE CRYSTALS TO THERMAL SHOCK-INDUCED STRAINS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Samuel Berkman, Florham Park, N.J.; Kyong-Min Kim, E. Windsor, N.J., and Harold E. Temple, Trenton, N.J.

Filed Aug. 31, 1978, Ser. No. 938,579

Int. Cl.[2] B01J *17/18*

U.S. Cl. 422—246 **3 Claims**



1. In combination with a susceptor particularly suited for use in growing edge-defined, film-fed growth techniques and characterized by a susceptor of a generally V-trough configuration, including a die through which a melt is drawn for forming a ribbon crystal and supported by a pedistal comprising a pair of horizontally oriented bars and a pair of vertically oriented posts connected in supporting relation with said bars:

A. means for delivering a stream of fluid coolant to impinge against said susceptor in close proximity with said die in non-incident relation with a ribbon crystal being formed, including a pair of orifices disposed beneath the susceptor for directing a pair of cooling streams of inert gas in substantially vertical directions toward said susceptor;

B. means defining in each of said vertically oriented posts a tubular bore extended axially therethrough and connected in communicating relation with one orifice of said pair; and

C. means for continuously delivering a stream of coolant to each of said bores.

4,216,187
METHOD OF DETOXIFYING ORGANOTIN-CONTAINING PAINT RESIDUES

Theodore Dowd, Arlington, Va., assignor to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

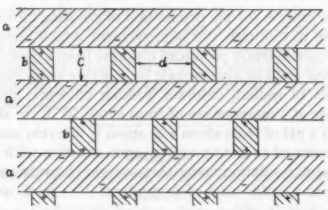
Filed Jun. 14, 1979, Ser. No. 48,328
Int. Cl.[2] C01G *19/00*
U.S. Cl. 423—98 1 Claim

1. The method of detoxifying substances which contain tributyltin acetate, which comprises: treating said substance with nitric acid to break the tin-carbon bond in said tributyltin acetate.

4,216,188
CROSS-LINKED MONTMORILLONITE MOLECULAR SIEVES

Joseph Shabtai, and Noam Lahar, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Sep. 23, 1977, Ser. No. 836,138
Claims priority, application Israel, Sep. 23, 1976, 50548
Int. Cl.[2] C01B *33/26*
U.S. Cl. 423—118 15 Claims



1. A process for the production of molecular sieves with comprises

reacting a colloidal solution of a monoionic montmorillonite having a concentration of 100 mg to 800 mg montmorillonite per liter, in the form of fully dispersed negatively charged unit layers at room temperature, with an aged sol of a metal hydroxide aged for at least 5 days at ambient temperature, said metal hydroxide being selected from the group consisting of aluminum hydroxide and chromium hydroxide, at a pH adjusted below the zero charge point having a residual net positive charge on the said metal hydroxide, under vigorous agitation, resulting in a rapid flocculation of the montmorillonite cross-linked with said metal hydroxide, separating the product from the liquid phase, and stabilizing the product by heat treatment.

4,216,189
SULFUR DIOXIDE REMOVAL PROCESS

Norman E. Nicholson, Stockton-on-Tees; John Scarlett, Kirk Merrington, and John F. Flintoff, Middlesbrough, all of England, assignors to Davy Powergas, Inc., Lakeland, Fla.

Continuation of Ser. No. 630,503, Nov. 10, 1975, abandoned.
This application Oct. 10, 1978, Ser. No. 949,545
Int. Cl.[2] C01B *17/00, 17/45;* C01D *5/00*
U.S. Cl. 423—242 10 Claims

1. In a process for the removal of sulfur dioxide from gas in which sulfur dioxide is absorbed from the gas in an aqueous absorption solution of sodium sulfite to form the corresponding bisulfite in an absorption zone, resulting bisulfite-containing spent absorption solution is desorbed in a desorption zone to form sulfur dioxide and crystalline sodium sulfite from solution and provide a slurry in said desorption zone containing at least about 25 weight percent solids, and a sulfite-containing absorption solution is regenerated for recycling by dissolution of crystallized sodium sulfite, and in which sodium sulfate is in the absorption-desorption medium, the improvement for removing sulfate from the system comprising dividing said spent absorption solution into portions, said spent absorption solution containing about 1 to about 10 weight percent of sodium sulfate and about 0.1 to 10 weight percent of sodium sulfite, said spent absorption solution containing a major amount of sodium bisulfite based on the weight of said satls, passing one of said portions to said desorption zone, evaporating water at a temperature of at least about 37° C. from another portion of said spent aqueous absorption-desorption solution to precipitate up to about 10 weight percent undissolved solids from said solution, said undissolved solids having a major amount of sulfate and a minor amount of sulfite, separating sulfate and sulfite-containing precipitate and bisulfite-containing solution from the resulting slurry, and passing said latter solution to the absorption-desorption cycle.

4,216,190
METHOD FOR MAKING β-FORM ALUMINUM TRIMETAPHOSPHATE

James E. Neely, Jr., Butler, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 26, 1978, Ser. No. 973,482
Int. Cl.[2] C01B *25/36*
U.S. Cl. 423—314 7 Claims

1. A method for preparing aluminum trimetaphosphate in the B-form comprising the steps of:

a. reacting aluminum dihydrogen phosphate with ammonia to form a reaction product; and

b. heating the reaction product to a sufficient temperature for a sufficient time that the crystal structure of the heat-treated reaction product is predominantly the B-form.

4,216,191
METHOD OF PREPARING INORGANIC-ALKALI METAL SALTS

Lawrence P. Klemann, Somerville, and Eugene L. Stogryn, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 1, 1979, Ser. No. 35,055
Int. Cl.[2] C01C *3/20*
U.S. Cl. 423—364 8 Claims

1. A method of preparing an alkali metal salt of the formula:

ZY

wherein Z is an alkali metal selected from the group consisting of Li and Na, and wherein Y is an inorganic radical selected from the group consisting of SCN, CN, CNS, OCN, Br, I, Cl, NO_2, NO_3, ClO_4, ReO_4, and CF_3SO_3 comprising:

reacting in ether solvent, a nitrogen-containing compound of the formula:

QHY

wherein Q is selected from the group consisting of NH_3; $N(CH_3)_3$, $HN(CH_3)_2$; H_2NCH_3; $N(C_2H_5)_3$; $HN(C_2H_5)_2$ and $H_2NC_2H_5$, wherein H is hydrogen and wherein Y is as defined above, with an alkali metal compound of the formula:

ZX

wherein Z is as defined above and wherein X is selected from the group consisting of H; NH_2; $N(CH_3)_2$; $HNCH_3$; $N(C_2H_5)_2$; HNC_2H_5; $N(i—CH(CH_3)_2)_2$; $—CH_3$; $—C_2H_5$; and $—C_6H_5$.

4,216,192
METHOD OF MAKING ANHYDROUS LITHIUM THIOCYANATE

Bhaskara M. L. Rao, Fanwood, and Lawrence P. Klemann, Somerville, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 30, 1979, Ser. No. 34,579
Int. Cl.[2] C01C *3/20*
U.S. Cl. 423—366 **15 Claims**

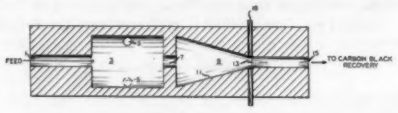
1. A method of preparing anhydrous lithium thiocyanate, comprising:

reacting one or more thiocyanate compounds selected from the group consisting of inorganic ammonium thiocyanate, quarternary alkyl ammonium thiocyanates, trialkyl ammonium thiocyanates, non-lithium alkali metal thiocyanates and alkaline earth metal thiocyanates, with one or more lithium salts selected from the group consisting of $LiClO_4$; $LiAsF_6$; $LiBF_4$; $LiPF_6$; LiO_3SCF_3; $LiNO_2$; $LiNO_3$; LiCl; LiBr; LiI; LiO_2CCF_3; $LiOC_6H_5$; $LiB(C_6H_5)_4$ and $LiBR_4$ wherein R is selected from the group consisting of methyl, ethyl, butyl or mixtures thereof, in an organic solvent in which the reactants are soluble.

4,216,193
RADIAL SECONDARY GAS FLOW CARBON BLACK REACTION METHOD

John W. Vanderveen, and King L. Mills, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 718,301, Aug. 27, 1976, Pat. No. 4,127,387. This application May 4, 1978, Ser. No. 902,653
Int. Cl.[2] C01B *31/02;* C09C *1/48*
U.S. Cl. 423—456 **3 Claims**



1. A method for producing carbon black having a tint residual of about −6 or less, said method comprising:

(a) axially passing feedstock into a cylindrical precombustion section of a carbon black reactor while generating a vortex of hot combustion gas in said precombustion section to produce a first mixture of feedstock and combustion gas;

(b) passing said first mixture axially from said precombustion section through an abruptly restricted passage;

(c) abruptly expanding said first mixture;

(d) converging the axially flowing mixture;

(e) mixing said converging first mixture with radial, opposite flow of combustion gas to form a second mixture; and

(f) in a confined reaction section producing carbon black from said second mixture.

4,216,194
METHOD OF PRODUCING METHANE AND CARBON

Robert B. Regier, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

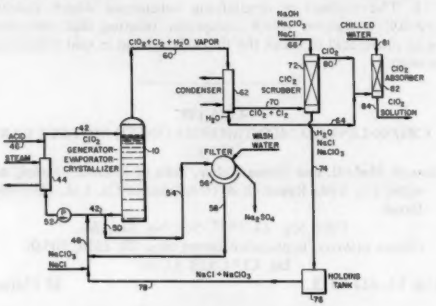
Continuation-in-part of Ser. No. 459,622, Apr. 10, 1974, abandoned. This application Nov. 6, 1975, Ser. No. 629,432
Int. Cl.[2] C07C *1/04;* C09C *1/48*
U.S. Cl. 423—459 **29 Claims**

1. A process comprising passing a feedstream comprising carbon monoxide and hydrogen into a molten salt bath under suitable reaction conditions, said molten salt bath containing suspended therein a catalytic amount of a finely divided Group VIII metal methanation catalyst, said suitable reaction conditions being such that said carbon monoxide and hydrogen react in said molten salt bath to produce carbon, methane, or both.

4,216,195
PRODUCTION OF CHLORINE DIOXIDE HAVING LOW CHLORINE CONTENT

Daniel J. Jaszka, Tonawanda, and Harold D. Partridge, Wilson, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed May 19, 1978, Ser. No. 907,432
Int. Cl.[2] C01B *11/02*
U.S. Cl. 423—478 **7 Claims**

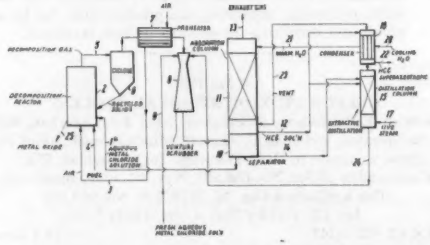


1. In a process for the production of chlorine dioxide by the reduction of chlorate, the improvement which comprises removing concurrently produced chlorine from a gaseous stream of chlorine and chlorine dioxide by reacting said chlorine with a mixture of sodium chlorate, sodium chloride, and sodium hydroxide at a temperature of from about 50° C. to about 100° C. and at a pH of from about 4 to about 9, wherein said mixture is proportioned so as to provide, upon reaction with the chlorine present, a solution containing sodium chloride and sodium chlorate in a molar ratio of from about 0.7:1 to about 5:1.

4,216,196
PROCESS FOR THERMALLY DECOMPOSING CHLORIDES OF BIVALENT OR MULTIVALENT METALS

Klaus Hohmann, Hofheim-Wildsachsen, Fed. Rep. of Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,510
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730646
Int. Cl.[2] C01B *7/08, 13/14*
U.S. Cl. 423—481 **4 Claims**



1. In a process for producing superazeotropic hydrochloric acid in which an incoming aqueous liquor containing bivalent or multivalent metal chloride is treated to form the corresponding metal oxide and hydrogen chloride wherein a solution of the metal chloride is thermally decomposed to produce said metal oxide and a hot gas containing hydrogen chloride, the improvement which comprises the steps of:

(a) adiabatically absorbing hydrogen chloride from said gas

to form a first hydrochloric acid solution with a subazeotropic hydrogen chloride concentration;

(b) generating vapors of a second hydrochloric acid solution with a hydrogen chloride concentration which is greater than that of the first hydrochloric acid solution with a subazeotropic concentration of hydrogen chloride by subjecting a first part of said first hydrochloric acid solution to extractive distillation in contact with a concentrated metal chloride solution of said bivalent or multivalent metal;

(c) cooling the remaining part of the first hydrochloric acid solution;

(d) condensing the vapors of the second hydrochloric acid solution generated during step (b) with the cooled remaining part of the first hydrochloric acid solution to form superazeotropic hydrochloric acid;

(e) recovering from the extractive distillation of step (b) another metal chloride solution less concentrated in the bivalent or multivalent metal chloride than the aqueous liquor supplied to the extractive distillation and increasing the concentration of the other metal chloride solution in the bivalent or multivalent metal chloride by direct heat exchange with hot gases formed by the decomposition, thereby evaporating water from said other metal chloride solution; and

(f) supplying said other metal chloride solution, after the increase in the concentration thereof in the bivalent or multivalent chloride and after at least a portion of said other metal chloride solution has been in direct contact with the gas formed by the decomposition, to the thermal decomposition process at a metal chloride rate which corresponds to the metal chloride content of the incoming aqueous liquor.

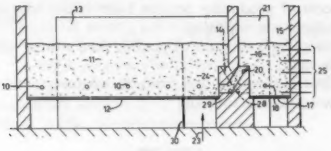
4,216,197
CONVERTING CALCIUM SULPHIDE TO CALCIUM OXIDE

Gerald Moss, Oxford, England, assignor to The United States of America as represented by the Administrator of the United States Environmental Protection Agency, Washington, D.C.

Continuation of Ser. No. 876,100, Feb. 8, 1978, abandoned, which is a continuation of Ser. No. 678,580, Apr. 20, 1976, abandoned. This application Oct. 17, 1978, Ser. No. 953,147

Int. Cl.[2] C01F *11/10*

U.S. Cl. 423—638 **7 Claims**



1. A method of selectively converting calcium sulfide to calcium oxide by horizontally circulating flow of calcium sulfide-containing particles through a single fluidized conversion bed, comprising treating particles containing calcium sulfide at temperatures in an elevated selective conversion temperature range in a single fluidized conversion bed wherein the particles are substantially uniformly fluidized by passing an oxygen-containing gas substantially uniformly into the bottom of the fluidized conversion bed, the calcium sulfide-containing particles being passed into the bed from an entrance at an upstream end of the bed, and treated particles being discharged from a downstream region of the bed via an exit at the downstream end of the downstream region, the exit being horizontally separated from the entrance whereby the discharge to particles via the exit causes a horizontal circulation of particles through the fluidized conversion bed, the mol ratio of oxygen to calcium sulfide at least in regions contiguous with the entrance being such as to cause substantially selective conversion of calcium sulfide to calcium oxide with the liberation of sulfur dioxide and the evolution of heat which maintains the temperature of the particles in the said contiguous regions substantially within the said selective conversion range whereby particles circulating into the downstream region have a calcium sulfide content which is too low in relation to the oxygen supplied to the downstream region for the selective conversion of calcium sulfide to calcium oxide, and adding a regulated amount of reducing agent other than calcium sulphide in the downstream region to react with oxygen therein and thereby cause the mol ratio of oxygen to calcium sulfide to be such that substantially selective conversion of calcium sulfide to calcium oxide takes place with the liberation of sulfur dioxide and the evolution of heat maintaining the temperature of the particles in the downstream region substantially within the said selective temperature range, whereby the particles discharged from the exit contain calcium oxide which has been substantially selectively converted from calcium sulfide in the fluidized conversion bed.

4,216,198
SELF-REGENERATING METHOD AND SYSTEM OF REMOVING OXYGEN AND WATER IMPURITIES FROM HYDROGEN GAS

Harold M. Simons, Orem, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed Dec. 19, 1977, Ser. No. 861,895

Int. Cl.[2] C01B *1/30, 1/35, 6/00*

U.S. Cl. 423—648 R **9 Claims**

1. In the storage of hydrogen in tanks containing a hydride-forming metallic reactant, a self-regenerating method of removing oxygen and water impurities, which would otherwise have a detrimental effect on the hydride-forming metallic reactant in the storage tanks, from the hydrogen gas being charged to the storage tanks, said method comprising:

(a) passing the impurity-containing hydrogen gas through a porous bed of a catalyst which is adapted to convert oxygen to water in the presence of hydrogen,

(b) passing the gas from step (a) through a porous bed of an adsorbent at a pressure of at least about 150 psia, said adsorbent being capable of adsorbing water from the hydrogen gas stream, thereby substantially removing water impurities from the hydrogen gas,

(c) feeding the hydrogen gas from step (b) to a storage tank containing a hydride-forming metallic reactant which absorbs the hydrogen by reacting therewith to form hydrogen-loaded metallic hydride,

(d) discontinuing the flow of hydrogen gas in steps (a), (b) and (c),

(e) treating the hydrogen-loaded metallic hydride in the storage tank to release hydrogen gas therefrom,

(f) passing the released hydrogen gas at a pressure of less than about 100 psia back through the porous bed of adsorbent used in step (b), thereby cleaning the bed of adsorbent of impurities deposited therein during step (b), and

(g) forwarding the released hydrogen gas to a hydrogen utilization unit.

4,216,199
HYDROGEN PRODUCTION FROM CARBONACEOUS FUELS USING INTERMEDIATE OXIDATION-REDUCTION

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Mar. 21, 1975, Ser. No. 560,341

Int. Cl.[2] C01B *1/08*

U.S. Cl. 423—657 **15 Claims**

1. A process for generating hydrogen from H_2O and a carbonaceous reducing composition which comprises

a. establishing a slurry which contains

1. a nongaseous intermediate and

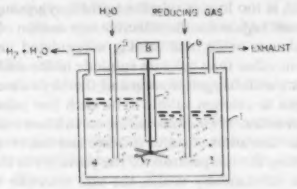
2. an oxide of the nongaseous intermediate,

b. contacting the slurry with steam, whereby a gaseous mixture of hydrogen and H_2O is formed, and the propor-

tion of oxide of the nongaseous intermediate in the slurry is increased,

c. removing the hydrogen, and

d. contacting the slurry with the carbonaceous reducing



composition, whereby the proportion of oxide of the nongaseous intermediate in the slurry is descreased,

wherein the slurry temperature is maintained in the approximate range of 700° K. to 1300° K. and the slurry pressure is maintained in the approximate range of 1 to 500 atmospheres.

4,216,200

DENTAL FILM AND METHOD OF FORMING THE SAME

William E. Horn, 1726 Professional Dr., Sacramento, Calif. 95824

Continuation of Ser. No. 539,622, Jan. 9, 1975, abandoned. This application Feb. 26, 1976, Ser. No. 661,430

Int. Cl.[2] A61K *7/18, 7/26*

U.S. Cl. 424—52 **6 Claims**

1. A dental solution suitable for use in forming a protective barrier on oral surfaces when mixed with saliva, consisting essentially of sodium fluoride in an aqueous solution containing menthol, Oil of Cloves, and Oil of Cinnamon in the proportions by weight of approximately 10:5:13, respectively, said sodium fluoride being present in the range of about 0.1 to 3.0 milligrams per total solution volume of approximately 10 to 40 milliliters.

4,216,201

COSMETIC EMULSION COMPOSITIONS HAVING SKIN MOISTURIZING PROPERTIES

Luis C. Calvo, Bayshore, N.Y., assignor to Germaine Monteil Cosmetiques Corp., Deer Park, N.Y.

Filed May 22, 1978, Ser. No. 908,178

Int. Cl.[2] A61K *7/021*

U.S. Cl. 424—63 **6 Claims**

1. A cosmetic make-up composition consisting of

	Parts by Weight
Mineral Oil 50 cp. visc.	5.55
Petrolatum, 45° C. melting point	2.25
Polyglyceryl-6-dioleate	4.50
Propyl para-hydroxy benzoate	0.10
Perhydro Squalene	5.85
Squalane	3.00
Ozokerite Wax	3.60
Imidazolidinyl Urea (Germall)	0.15
Methyl para-hydroxy benzoate	0.15
Magnesium Stearate (Food grade)	0.50
Iron Oxide Pigments	10.00
Deionized Water	64.35

4,216,202

SEX ATTRACTANT FOR CORN EARWORM MOTHS

Jerome A. Klun, Potomac; Jack R. Plimmer, Columbia, both of Md.; Alton N. Sparks, Tifton, Ga., and Barbara B. Leonhardt, Potomac, Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 29, 1979, Ser. No. 25,136

Int. Cl.[2] A01N *17/14*

U.S. Cl. 424—84 **3 Claims**

1. An attractant for the adult male corn earworm moths comprising an effective amount of an effective attractant combination of (Z)-11-hexadecenal and (Z)-9-hexadecenal, said components being at least 99.0% pure, and combined at a ratio of about 115 to 2.25 on a weight basis, and an effective antioxidant amount of 2,6-di-tert-butyl-4-methyl phenol.

4,216,203

PROCESS FOR PRODUCING INTERFERON

Michael D. Johnston, Beckenham, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Jul. 14, 1978, Ser. No. 924,703

Claims priority, application United Kingdom, Jul. 15, 1977, 29871/77

Int. Cl.[2] A61K *45/02*

U.S. Cl. 424—85 **6 Claims**

1. A process for producing interferon which comprises adding an inducer to epithelial or lymphoblastoid cells which are susceptible to being induced to form interferon the improvement which comprises incubating the cells, prior to induction, in a medium containing an effective non-toxic amount of a straight chain, alkansic acid having from 2 to 6 carbon atoms, or a salt thereof.

4,216,204

MEDICAL PROTEIN HYDROLYSATE, PROCESS OF MAKING THE SAME AND PROCESSES OF UTILIZING THE PROTEIN HYDROLYSATE TO AID IN HEALING TRAUMATIZED AREAS

Harry J. Robertson, Wesley Dr., Salisbury, Md. 21801

Division of Ser. No. 685,050, May 10, 1976, Pat. No. 4,094,973, which is a continuation-in-part of Ser. No. 409,145, Oct. 24, 1973, abandoned. This application May 8, 1978, Ser. No. 903,588

Int. Cl.[2] A61K *35/12;* **C07G** *7/00;* **A61K** *37/00*

U.S. Cl. 424—95 **18 Claims**

1. Process of producing protein hydrolysate having therapeutic properties comprising:

(a) comingling a mixture of poultry feet protein and dilute acetic acid;

(b) recovering the solution from the mixture; and

(c) dewatering the solution.

4,216,205

PROCESS OF PREPARING A SERUM PROTEIN COMPOSITION FOR INTRAVENOUS APPLICATION

Markus Radowitz, Krefeld, Fed. Rep. of Germany, assignor to Armour Pharmaceutical, Scottsdale, Ariz.

Filed Jan. 23, 1978, Ser. No. 871,620

Claims priority, application Switzerland, Jan. 26, 1977, 934/77; Austria, Mar. 17, 1977, 1859/77

Int. Cl.[2] A61K *35/14;* **C07G** *7/00*

U.S. Cl. 424—101 **4 Claims**

1. A process for preparing a stable serum protein composition of improved passive immunilogical properties, suitable for use in prophylactic therapy and the strengthening of the human body weakened by loss of blood, wherein the starting product for said process is more readily available than the human blood which is used in conventional processes for obtaining serum protein compositions, said process comprising the steps of:

(a) mixing and suspending plasma fractions together in a suitable physiologically acceptable solvent to produce a

mixture, said fractions and the amounts thereof being selected in such a manner that an immunologically effective amount of active antibodies is incorporated into the mixture, said fractions being characterized as equivalent to:

(i) COHN-fractions IV and II/III, or

(ii) fractions II, III and IV according to Steinbuck;

(b) removing the insoluble components remaining in the mixture and recovering the supernatant;

(c) stabilizing and purifying the super natant by removing storage instable proteins, thereafter subjecting the supernatant to a clarifying filtration and concentrating the resulting solution to remove substantially all blood constituents having a molecular weight of less than 10,000 to produce a purified solution;

(d) standardizing the purified solution to the physiological conditions of the isotonic parameters according to human blood by means of a NaCl solution.

4,216,206

ANTIBIOTICS S 53210/A-I, S 53210/A-II AND S 53210/A-III

Camilla Keller-Juslen, and Hamilton D. King, both of Basel, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 917,770, Jun. 21, 1978, abandoned. This application Jan. 19, 1979, Ser. No. 4,804 Claims priority, application Switzerland, Jun. 23, 1977, 7716/77; Oct. 20, 1977, 12795/77

Int. Cl.[2] H61K *35/66*; C12D *9/14*

U.S. Cl. 424—117 **7 Claims**

1. A compound selected from the group consisting of:

(1) S 53210/A-I having a UV spectrum in acetonitrile as shown in FIG. 1, an IR spectrum in KBr as shown in FIG. 2, an ^{1}H-NMR spectrum in DMSO at 90 MHz with tetramethylsilane as internal standard as shown in FIG. 3 and an elementary analysis of C 48.8%, H 4.1%, N 12.4%, O 19.5%, S 13.7%,

(2) S 53210/A-II having a UV spectrum in acetonitrile as shown in FIG. 4, an IR spectrum in KBr as shown in FIG. 5 and ^{1}H-NMR spectrum in DMSO at 90 MHz with tetramethylsilane as internal standard as shown in FIG. 6 and an elementary analysis of C 48.8%, H 4.3%, N 11.9%, O 19.5%, S 12.5%; and

(3) S 53210/A-III having a UV spectrum in acetonitrile as shown in FIG. 7, an IR spectrum in KBr as shown in FIG. 8, an ^{1}H-NMR spectrum in DMSO at 90 MHz with tetramethylsilane as internal standard as shown in FIG. 9 and an elementary analysis of C 52.0%, H 5.0%, N 12.%, O 20.0%, S 11.0%.

4,216,207

METHOD AND COMPOSITION FOR TREATMENT OF GASTRO-DUODENAL ULCERS

Ioan Puscas; Aurel Chiu; Livia Voicu, all of Simleul Silvaniei; Dorin Breazu, Cluj-Napoca; Iuliu Ciupe, Cluj-Napoca; Ioan Pop, Cluj-Napoca; Mioara R. Buten, Cluj-Napoca; Lazar Terec, Papiu Ilarion, and Aurel Lerintiu, Simleul Silvaniei, all of Romania, assignors to Centrala Industriala de Medicamente Cosmetice Coloranti si Lacuri, Bucharest, Romania

Continuation-in-part of Ser. No. 906,205, May 15, 1978, abandoned. This application Feb. 9, 1979, Ser. No. 10,905 Claims priority, application Romania, May 14, 1977, 90348

Int. Cl.[2] A61K *33/04*

U.S. Cl. 424—164 **6 Claims**

1. Pharmaceutical commposition for the treatment and healing of gastro-duodenal ulcers comprising a mixture of from 25–50 percent, by weight, benzothiazole-2-sulfonamide and from 75–50 percent, by weight, barium sulfate.

4,216,208

N-ACYL DERIVATIVES OF GLUCOSAMINES HAVING ANTITUMOR CHEMOTHERAPEUTIC ACTIVITY

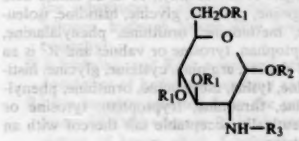
Augusto De Barbieri, Milan, Italy, assignor to Proter S.p.A., Milan, Italy

Filed Jul. 31, 1978, Ser. No. 929,237

Int. Cl.[2] A61K *37/00*; C07C *103/52*; A61K *31/70*

U.S. Cl. 424—177 **16 Claims**

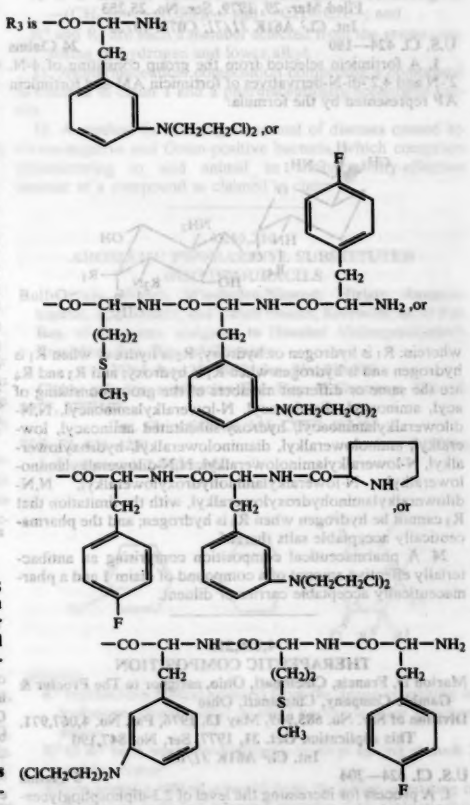
1. A N-acyl derivative of glucosamine selected from the group consisting of a compound of the formula:



wherein:

R_1 is —H, —$COCH_3$;

R_2 is —H, —$COCH_3$, C_1 to C_6 alkyl, or a benzyl group;



or a salt thereof with an organic or inorganic acid physiologically tolerated.

4,216,209
TRIPEPTIDE ANGIOTENSIN CONVERTING ENZYME INHIBITORS

Francesco Bellini, St. Laurent, and Hans U. Immer, Mount Royal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 19, 1979, Ser. No. 21,737
Int. Cl.[2] A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 8 Claims

1. A compound of formula I

$$HSCH_2CHR^1CO\text{-}Pro\text{-}R^2\text{-}R^3\text{-}OH$$

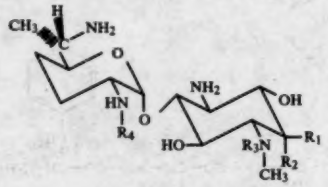
in which R^1 is hydrogen or lower alkyl; R^2 is an amino acid residue of alanine, arginine, cysteine, glycine, histidine, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, serine, threonine, tryptophan, tyrosine or valine; and R^3 is an amino acid residue of alanine, arginine, cysteine, glycine, histidine, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine or valine; or a pharmaceutically acceptable salt thereof with an inorganic or organic base.

4,216,210
FORTIMICINS AM AND AP DERIVATIVES

Ronald E. Carney, Gurnee, and James B. McAlpine, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 29, 1979, Ser. No. 25,253
Int. Cl.[2] A61K *31/71*; C07H *15/22*
U.S. Cl. 424—180 24 Claims

1. A fortimicin selected from the group consisting of 4-N, 2'-N and 4,2'-di-N-derivatives of fortimicin AM and fortimicin AP represented by the formula:



wherein: R_1 is hydrogen or hydroxy; R_2 is hydroxy when R_1 is hydrogen and is hydrogen when R_1 is hydroxy; and R_3 and R_4 are the same or different members of the group consisting of acyl, aminoacyl, diaminoacyl, N-loweralkylaminoacyl, N,N-diloweralkylaminoacyl, hydroxy-substituted aminoacyl, loweralkyl, aminoloweralkyl, diaminoloweralkyl, hydroxyloweralkyl, N-loweralkylaminoloweralkyl, N,N-diloweralkylaminoloweralkyl, N-loweralkylaminohydroxyloweralkyl, N,N-diloweralkylaminohydroxyloweralkyl, with the limitation that R_3 cannot be hydrogen when R_4 is hydrogen; and the pharmaceutically acceptable salts thereof.

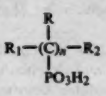
24. A pharmaceutical composition comprising an antibacterially effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier or diluent.

4,216,211
THERAPEUTIC COMPOSITION

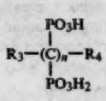
Marion D. Francis, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 685,969, May 13, 1976, Pat. No. 4,067,971.
This application Oct. 31, 1977, Ser. No. 847,190
Int. Cl.[2] A61K *31/66*
U.S. Cl. 424—204 5 Claims

1. A process for increasing the level of 2,3-diphosphoglycerate in the blood of a human or lower animal in need of such treatment, comprising administering to said human or lower animal sufficient organophosphonate compound selected from the group consisting of vicinal organophosphonates of the formula



and geminal organophosphonates of the formula



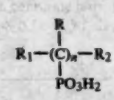
and pharmaceutically acceptable salts thereof, wherein n is an integer from 1 to about 10; R, R_1 and R_2 are H,—CH_2OH, C_1–C_{20} alkyl or cycloalkyl, C_2–C_{20} alkenyl, aryl, phenylethyl, benzyl, halogen, amino, substituted amino, —CH_2COOH, —$CH_2PO_3H_2$, —$CH(PO_3H_2)$ (OH) or —$CH_2CH(PO_3H_2)_2$; R_3 is H, C_1–C_{20} alkyl or cycloalkyl, C_2–C_{20} alkenyl, aryl, phenylethyl, benzyl, halogen, amino, substituted amino, —CH_2COOH, —$CH_2PO_3H_2$, —$CH(PO_3H_2)$ (OH) or —$CH_2CH(PO_3H_2)_2$; and R_4 is H, lower alkyl, amino, benzyl, halogen, OH, —CH_2COOH, —$CH_2PO_3H_2$ or —$CH_2CH_2PO_3H_2$ to increase the blood level of said 2,3-diphosphoglycerate.

4,216,212
PYRAZOLIDINE ANTI-INFLAMMATORY COMPOSITION AND METHODS OF USE

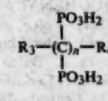
Lawrence Flora, Hamilton, and Marion D. Francis, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 801,707, May 31, 1977, abandoned.
This application Jun. 8, 1978, Ser. No. 913,636
Int. Cl.[2] A61K *31/66*, *31/415*, *0/00*
U.S. Cl. 424—204 23 Claims

12. A method for treating or preventing pain and inflammation in animal tissues, comprising administering to an animal in need of such treatment a safe and effective amount of a pyrazolidine-based anti-inflammatory compound selected from the group consisting of phenylbutazone, oxyphenbutazone, and the pharmaceutically-acceptable salts and esters thereof, and a safe and effective amount of an organophosphonate compound selected from the group consisting of vicinal organophosphonates of the formula



and geminal organophosphonates of the formula



or pharmaceutically acceptable salts thereof, wherein n is an integer from 1 to about 10; R, R_1 and R_2 are H, —CH_2OH, C_1–C_{20} alkyl or cycloalkyl, C_2–C_{20} alkenyl, aryl, phenylethyl, benzyl, halogen, amino, substituted amino, —CH_2COOH, —$CH_2PO_3H_2$, —$CH(PO_3H_2)(OH)$ or —$CH_2CH(PO_3H_2)_2$; R_3 is H, C_1–C_{20} alkyl or cycloalkyl, C_2–C_{20} alkenyl, aryl phenylethyl, benzyl, halogen, amino, substituted amino, —CH_2COOH, —$CH_2PO_3H_2$, —$CH(PO_3H_2)(OH)$ or —$CH_2CH(PO_3H_2)_2$; and R_4 is H, lower alkyl, amino, benzyl, halogen, OH, —CH_2COOH, —$CH_2PO_3H_2$ or —$CH_2CH_2PO_3P_2$.

4,216,213

ACARICIDAL AND INSECTICIDAL COMPOSITIONS

Ludwig Emmel, Frankfurt am Main; Hans Röchling, Bad Soden am Taunus, and Günther Seyfarth, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Apr. 24, 1979, Ser. No. 32,767

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1978, 2818497

Int. Cl.[2] A01N *9/36, 9/24*

U.S. Cl. 424—219 3 Claims

1. An acaricidal and insecticidal composition consisting essentially of a mixture of (7-chloro-bicyclo-[3,2,0]hepta-2,6-dien-6-yl)dimethyl phosphate (compound I) with 2-sec.butyl-4,6-dinitrophenyl-3-methyl crotonate (compound II) or with 2-sec.butyl 4,6-dinitrophenyl-isopropyl carbonate (compound III), the weight ratio of compound I to compound II or to compound III being from 1:20 to 20:1.

4,216,214

4-TERT. BUTYL-3'-CHLORODIPHENYLAMINE DERIVATIVES, THEIR PREPARATION AND THEIR APPLICATION AS ANTI-HISTAMINIC DRUGS

Antonio Esteve Subirana, and Jose Esteve Soler, both of Barcelona, Spain, assignors to PRODESIN (Productos Esteve Internacional S.A.), Barcelona, Spain

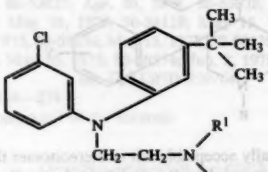
Filed Dec. 27, 1977, Ser. No. 864,781

Claims priority, application France, Jan. 4, 1977, 77 00051

Int. Cl.[2] C07D *295/12;* A61K *31/535, 31/495, 31/435*

U.S. Cl. 424—244 11 Claims

1. Compounds of formula I and the pharmaceutically acceptable acid addition salts thereof,



(I)

wherein R_1 and R_2 are the same or different and each is a lower alkyl group or R^1 and R^2 together with the nitrogen atom to which they are attached, form a saturated heterocyclic group selected from the group consisting of pyrrolidino, piperidine, piperazine, morpholine and perhydroazepine groups.

4. A pharmaceutical formulation for treatment of gastroduodenal illnesses, consisting of an effective amount, at least one of the derivatives of formula (I) according to claim 1 as active ingredient in combination with a pharmaceutically acceptable carrier or diluent.

4,216,215

7[(FURANYL-2-ACETAMIDO)-2-ACETAMIDO]CEPHALOSPORIN DERIVATIVES

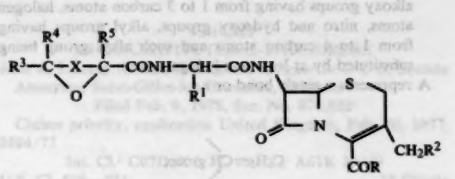
Barry C. Ross, Birchington, and Braham Shroot, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 838,830, Oct. 3, 1977, Pat. No. 4,137,312, which is a division of Ser. No. 628,543, Nov. 3, 1975, Pat. No. 4,064,241. This application Nov. 6, 1978, Ser. No. 957,869

Int. Cl.[2] A61K *31/545;* C07D *501/34*

U.S. Cl. 424—246 12 Claims

1. A compound of the formula



and the pharmaceutically acceptable base salts thereof, wherein

R^1 is a member selected from the group consisting of phenyl, thienyl and 2-furyl, and monosubstituted phenyl wherein the substituent is chosen from the group consisting of halogen, hydroxy, lower alkyl, lower alkoxy and trifluoromethyl;

R is hydroxy, and R^2 is a member selected from the group consisting of hydrogen, acetoxy and carbamoyloxy;

R^3 is a member selected from the group consisting of carboxy, $COOR^6$ wherein R^6 is chosen from the group consisting of lower alkyl, 5-indanyl, naphthyl, phenyl and monosubstituted phenyl wherein the substituent is chosen from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl, and $CONR^7R^8$ wherein R^7 and R^8 are each chosen from the group consisting of hydrogen, lower alkyl and cycloalkyl having from three to six carbon atoms;

X is a member selected from the group consisting of $—(CH_2)_2—$, $—(CH_2)_3—$ and $—CH=CH—$; and

R^4 and R^5 are each a member selected from the group consisting of hydrogen and lower alkyl.

11. A pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

12. A method for treating an animal of diseases caused by Gram-negative and Gram-positive bacteria, which comprises administering to said animal an antibacterially-effective amount of a compound as claimed in claim 1.

4,216,216

AROMATIC PIPERAZINYL SUBSTITUTED DIHYDROURACILS

Rolf-Ortwin Weber, Wiesbaden-Naurod; Hiristo Anagnostopulos, Taunusstein, and Ulrich Gebert, Kelkheim, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

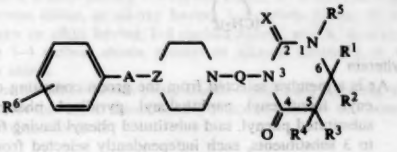
Filed Jun. 15, 1978, Ser. No. 915,899

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727469

Int. Cl.[2] A61K *31/505;* C07D *403/06*

U.S. Cl. 424—251 7 Claims

1. Compounds of formula



wherein

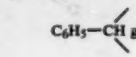
R^1 repreesnts a radical selected from the group consisting of hydrogen, phenyl, tolyl or alkyl having at most 2 carbon atoms;

R^2 to R^5 each represent hydrogen or alkyl having at most 2 carbon atoms;

R^6 represents a radical selected from the group consisting of hydrogen, anellated benzene nucleus, 1 to 3 identical or different substituents selected from the group consisting of

alkoxy groups having from 1 to 3 carbon atoms, halogen atoms, nitro and hydroxy groups, alkyl groups having from 1 to 4 carbon atoms and such alkyl group being substituted by at least one halogen atom;

A represents a single bond or a



Q represents a radical selected from the group consisting of single bond, straight-chained or branched alkylene group of formula $-C_nH_{2n}-$ in which n is from 2 to 6, at least two carbon atoms being between the two nitrogen atoms to which Q is attached and such an alkylene group; being substituted by not more than (n-2) hydroxy groups which are bound to a carbon atom not being linked to one of the nitrogen atoms to which Q is attached;

X is oxygen or sulphur atom; and

Z is nitrogen or the group

and acid addition salts thereof.

6. A pharmaceutical composition containing as active ingredients effective amounts for treating migraine at least one compound as claimed in claim 1 or a physiologically acceptable acid addition salt thereof in association with a pharmaceutical carrier or excipient.

4,216,217
NOVEL (1-ARYLCYCLOALKYLMETHYL) ISOTHIOCYANATES

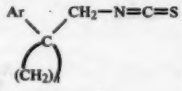
Marcel Van der Aa, Vosselaar, and Raymond Stokbroekx, Beerse, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 950,968, Oct. 13, 1978, abandoned. This application May 16, 1979, Ser. No. 39,613

Int. Cl.[2] **A01N** *9/00, 9/18;* **C07C** *161/02;* **C07D** *333/00*

U.S. Cl. 424—263 **4 Claims**

1. A chemical compound selected from the group consisting of an (1-arylcycloalkylmethyl)isothiocyanate having the formula

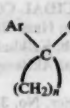


wherein

Ar is a member selected from the group consisting of thienyl, halothienyl, naphthalenyl, pyridinyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents, each independently selected from the group consisting of lower alkyl, lower alkyloxy, lower alkylthio, halo, amino, nitro, cyano and trifluoromethyl; and

n is an integer of from 2 to 5 inclusive.

4. A composition for combating fungi, bacteria and insects comprising an inert carrier material and as an active ingredient an effective amount of a compound selected from the group consisting of an (1-arylcycloalkylmethyl)isothiocyanate having the formula



wherein

Ar is a member selected from the group consisting of thienyl, halothienyl, naphthalenyl, pyridinyl, phenyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents, each independently selected from the group consisting of lower alkyl, lower alkyloxy, lower alkylthio, halo, amino, nitro, cyano and trifluoromethyl; and

n is an integer of from 2 to 5 inclusive.

4,216,218
ANTIDEPRESSANT AND ANALGESIC 4-ARYLOXY- AND 4-ARYLTHIO-3-PHENYLPIPERIDINES

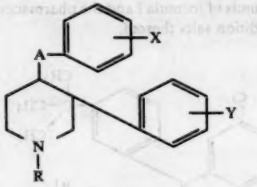
Solomon S. Klioze, Flemington, and Frederick J. Ehrgott, Bernardsville, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Feb. 23, 1979, Ser. No. 14,548

Int. Cl.[2] **A61K** *31/445;* **C07D** *211/46, 211/54*

U.S. Cl. 424—267 **55 Claims**

1. A compound of the formula



or a physiologically acceptable salt or stereoisomer thereof in which A is oxygen or sulfur; R is hydrogen, loweralkyl, lowercycloalkylloweralkyl, loweralkenyl, loweralkynyl, loweralkanoyl, lowercycloalkylloweralkanoyl, $-COOR_1$, or $-R_2PhZ$; R_1 is loweralkyl, loweralkenyl or $-CH_2CCl_3$; R_2 is loweralkylene, oxyloweralkylene, loweralkylenecarbonyl, carbonylloweralkylene or alkylene ethylene ketal; Ph is phenyl or phenylene;

Z is hydrogen, halogen, loweralkyl, loweralkoxy, hydroxy, nitro or amino; and X and Y are the same or different and each can be hydrogen, loweralkyl, loweralkoxy, halogen, nitro, amino, acetamido, trifluoromethyl, hydroxy or cyano.

4,216,219
DIMERIC OXAZOLE DERIVATIVES

William J. Ross, Lightwater, and Alec Todd, Wokingham, both of England, assignors to Lilly Industries Limited, London, England

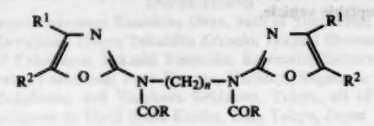
Filed Feb. 7, 1979, Ser. No. 10,185

Claims priority, application United Kingdom, Feb. 14, 1978, 5747/78

Int. Cl.[2] **A61K** *31/42;* **C07D** *263/48*

U.S. Cl. 424—272 **12 Claims**

1. A compound of the formula:



where R is C_{2-6} alkyl, R^1 and R^2 are hydrogen or C_{1-4} alkyl and n is 3 to 6.

2. A pharmaceutical formulation useful in the treatment of asthma which comprises a compound of claim 1 associated with a pharmaceutically acceptable carrier therefor.

4,216,220

PLATELET AGGREGATION INHIBITING 2-OXYINDOLES, THEIR COMPOSITIONS AND METHOD OF USE

Kazuyuki Nakagawa, Tokushima; Minoru Uchida, Komatsushima, and Kimiaki Oka, Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

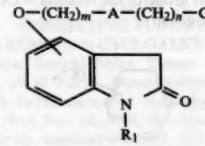
Division of Ser. No. 588,475, Jun. 19, 1975, Pat. No. 4,070,470. This application Jun. 15, 1977, Ser. No. 806,926

Claims priority, application Japan, Jun. 24, 1974, 49-72472; Jun. 24, 1974, 49-72473; Jul. 5, 1974, 49-77660; Jul. 5, 1974, 49-77661; Aug. 16, 1974, 49-94376; Apr. 30, 1975, 50-53026; Apr. 30, 1975, 50-53027; Apr. 30, 1975, 50-53028; May 15, 1975, 50-58127; May 15, 1975, 50-58128; May 15, 1975, 50-58129; May 15, 1975, 50-58134; May 15, 1975, 50-58135; May 16, 1975, 50-58872; May 16, 1975, 50-58874; Jun. 2, 1975, 50-66729

Int. Cl.² C07D *209/04*

U.S. Cl. 424—274 **5 Claims**

1. A compound of the formula



where R_1 is selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, benzyl and phenethyl; A is —CH=CH— or

wherein R_2 or R_3 may be the same or different and are selected from the group consisting of hydrogen and C_{1-4} alkyl; R_5 is selected from the group consisting of hydrogen, C_{1-8} alkyl, cyclohexyl, benzyl and phenethyl and m and n each are zero or a positive integer with m+n being no more than 11.

4. A method for inhibiting platelet aggregation in the blood of a subject which comprises administering to the subject a pharmaceutical composition containing the compound of claim 1 and a pharmaceutically acceptable carrier in a dosage equivalent to about 0.1 mg. to about 100 mg. of said compound per day per kg. of weight of the subject.

4,216,221

1,3-DISUBSTITUTED (2-THIO)UREAS

Jean de Lannoy, Brussels, Belgium, assignor to U C B, Societe Anonyme, Saint-Gilles-lez-Bruxelles, Belgium

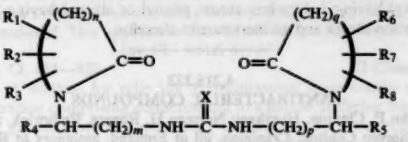
Filed Feb. 9, 1978, Ser. No. 876,922

Claims priority, application United Kingdom, Feb. 10, 1977, 5494/77

Int. Cl.² C07D *401/12, 403/12;* A61K *31/40*

U.S. Cl. 424—274 **15 Claims**

1. A 1,3-disubstituted urea or 2-thiourea having the formula



wherein

R_1, R_2, R_3, R_6, R_7 and R_8 represent independently hydrogen, alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, alkylene forming together with the carbon atom to which it is attached a cycloalkane ring having 5 or 6 carbon atoms, phenyl, naphthyl, halogen-substituted phenyl or halogen-substituted naphthyl,

R_4 and R_5 represent independently hydrogen, alkyl having 1 or 2 carbon atoms or phenyl,

n and q are independently 3, 4, 5, 6 or 7,

m and p are independently 0, 1 or 2, and

X is oxygen or sulfur.

12. A compound according to claim 1, wherein each of n and q is 3.

4,216,222

ALKYL OR ALKOXY-O-ALKYL-S-[N-(2-ALKYL, PHENYL OR VINYL-1,3-DIOXOLAN-4-YL) METHYLAMINOACETYL] DITHIOPHOSPHATES OR PHOSPHONATES AS INSECTICIDES AND ACARICIDES

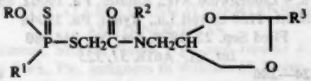
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 30, 1979, Ser. No. 62,201

Int. Cl.² A01N *9/28*

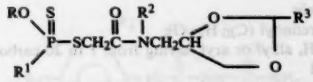
U.S. Cl. 424—278 **8 Claims**

1. Compounds having the structural formula



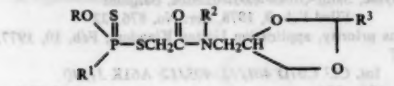
wherein R is alkyl having 1–5 carbon atoms; R^1 is alkyl having 1–4 carbon atoms, or alkoxy having 1–2 carbon atoms; R^2 is hydrogen or alkyl having 1–4 carbon atoms; and R^3 is alkyl having 1–4 carbon atoms, phenyl or alkenyl having 2 to 4 carbon atoms.

7. The method of controlling insects comprising applying to the habitat thereof an insecticidally effective amount of a compound of the formula



wherein R is alkyl having 1–5 carbon atoms; R^1 is alkyl having 1–4 carbon atoms, or alkoxy having 1–2 carbon atoms; R^2 is hydrogen or alkyl having 1–4 carbon atoms; and R^3 is alkyl having 1–4 carbon atoms, phenyl or alkenyl having 2–4 carbon atoms.

8. The pesticidal composition comprising a pesticidally effective amount of a compound of the formula



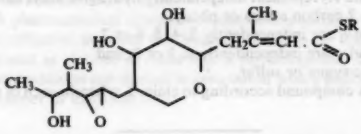
wherein R is alkyl having 1–5 carbon atoms; R^1 and is alkyl having 1–4 carbon atoms, or alkoxy having 1–2 carbon atoms; R^2 is hydrogen or alkyl having 1–4 carbon atoms; and R^3 is alkyl having 1–4 carbon atoms, phenyl or alkenyl having 2–4 carbon atoms and an inert carrier therefor.

4,216,223
ANTIBACTERIAL COMPOUNDS

John P. Clayton, Horsham; Norman H. Rogers, Rudgwick, and Steven Coulton, Cranleigh, all of England, assignors to Beecham Group Limited, United Kingdom

Filed Nov. 22, 1978, Ser. No. 962,953
Claims priority, application United Kingdom, Dec. 3, 1977, 50443/77
Int. Cl.[2] A61K *31/35*; C07D *309/06*
U.S. Cl. 424—283 9 Claims

1. A compound of formula:



wherein R is a pharmaceutically acceptable ester-forming radical.

9. The method for the treatment of human and veterinary bacterial and mycoplasmal infections which comprises administering to a human or veterinary animal an antibacterially or antimycoplasmally effective amount of a compound according to claim 1.

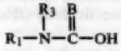
4,216,224
METHODS AND COMPOSITIONS FOR TREATING PSORIASIS WITH RETINOYL COMPOUNDS

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046

Filed Sep. 22, 1978, Ser. No. 944,980
Int. Cl.[2] A61K *31/325*
U.S. Cl. 424—286 44 Claims

1. A method of alleviating the symptoms of psoriasis in humans comprising topically applying to involved areas of the human body an effective amount of a composition comprising:

a therapeutically effective amount of at least one compound having the formula:



wherein

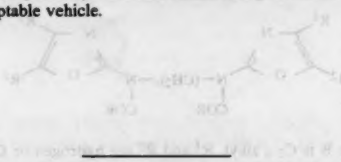
R_1 = retinoyl ($C_{20}H_{27}O$);

R_3 = H, alkyl or aryl having from 1 to 20 carbon atoms; and

B = O or S, or salt thereof formed with organic or inorganic alkalis, in a pharmaceutically acceptable vehicle.

21. A method of alleviating the symptoms of psoriasis in humans comprising topically applying to involved areas of the human body an effective amount of a composition comprising:

a therapeutically effective amount of N-cyclohexyl-N-retinoyl-N'-cyclohexyl-carbamic amide in a pharmaceutically acceptable vehicle.

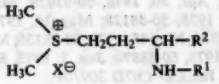


4,216,225
METHYLMETHIONINESULFONIUM COMPOUNDS, PROCESS FOR THEIR PREPARATION, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Masami Shiratsuchi, Musashimurayama; Kiyoshi Kawamura, Higashimurayama; Hisashi Kunieda, Higashimurayama; Naoki Machida, Higashimurayama; Toshihiro Akashi, Higashimurayama, and Masahiko Nagakura, Sayama, all of Japan, assignors to Kowa Company, Ltd., Japan

Filed May 16, 1978, Ser. No. 906,567
Claims priority, application Japan, May 18, 1977, 52-56310
Int. Cl.[2] A61K *31/55*, *31/215*
U.S. Cl. 424—287 15 Claims

1. An ulcer treating composition composed of (1) an antiulceratively effective amount of a methylmethioninesulfonium compound of the formula

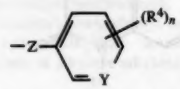


(I)

wherein

$X^{\ominus}$ represents an anion;

R^1 represents an acyl group of the formula —COR^3 in which R^3 represents the group



in which Z represents a direct bond, Y represents C, R^4 represents a member selected from the class consisting of a hydrogen atom, lower alkyl groups, lower alkoxy groups, di-lower-alkylamino groups and a sulfamoyl group, n is a number of 1 to 3, and two or more R^4 groups may be identical or different; and R^2 represents the group —$COOR^5$ in which R^5 represents a hydrogen atom, an alkyl group with 1 to 5 carbon atoms or a metal- or metal complex-forming moiety, or the group

in which R^6 groups may be identical or different, and each represent a hydrogen atom or an alkyl group with 1 to 5 carbon atoms.

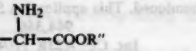
8. The compound according to claim 1 wherein R^4 = hydrogen, R^2 = $COOR^5$, R^5 = $Al_3(OH)_4$ and $X^{\ominus}$ = Cl.

4,216,226
ANTIVIRAL AGENT AND TREATMENT OF VIRAL INFECTIONS

Harumi Fukuyasu; Zenichiro Ohya, both of Yokohama; Katsuo Kawakami, Tokyo; Takahiko Kikuchi; Takashi Shomura, both of Yokohama; Takashi Tsuruoka, Kawasaki; Tetsuro Watanabe, Yokohama; Yuzo Kazuno, Hachioji; Shigeharu Inouye, Yokohama, and Yasuharu Sekizawa, Tokyo, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,627
Claims priority, application Japan, Jun. 6, 1977, 52/65739
Int. Cl.[2] A61K *31/22, 31/66, 31/44, 31/195*
U.S. Cl. 424—311 **8 Claims**

1. A method of therapeutically treating a viral infection in warm-blooded animals and fishes, which comprises administering an antivirally effective amount of a glycine derivative of the formula:



wherein R′ is $-CH_2NH_2$, $-CH_2NHCONH_2$, $-CH_2NHCONHOH$ and R″ is hydrogen or alkyl of 1–4 carbon atoms, or a pharmaceutically acceptable acid-addition salt thereof, to an animal or fish in need of such treatment.

4,216,227
OMEGA-AMINO ACID ESTER HYDROCHLORIDES FOR TREATING BACTERIAL INFECTIONS

Elton S. Cook, 1842 Madison Rd., Cincinnati, Ohio 45206, and Akira Fujii, 870-1 Sakaecho, Nishi-2, Matsudo-shi, Chibaken, Japan

Filed Jul. 24, 1978, Ser. No. 927,059
Int. Cl.[2] A61K *31/22, 31/23*
U.S. Cl. 424—311 **6 Claims**

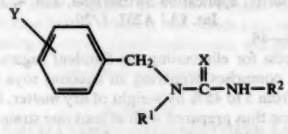
1. A method of treating a bacterial infection in a mammal comprising administering to said mammal suffering from said bacterial infection an antibacterial effective amount of an omega-amino acid ester having the formula $H_2N(CH_2)_nCOO(CH_2)_{n'}CH_3.HCl$ wherein n is a natural number 1 through 7 and n′ is a natural number 5 through 9.

4,216,228
COMBATING FUNGI WITH N-BENZYL-N-CYCLOALKYL-UREAS

Yasuo Yamada; Junichi Saito; Tatsuo Tamura, and Yoshio Kurahashi, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,387
Claims priority, application Japan, Jul. 12, 1977, 52/82602
The portion of the term of this patent subsequent to Nov. 28, 1995, has been disclaimed.
Int. Cl.[2] A01N *9/12, 9/20*; C07C *127/15, 157/05*
U.S. Cl. 424—322 **16 Claims**

1. An N-benzyl-N-cycloalkyl-urea of the formula



in which
R^1 represents cycloalkyl with 5–8 carbon atoms in the ring, which may be optionally substituted by alkyl with 1–8 carbon atoms,
R^2 represents alkyl with 1–8 carbon atoms, cycloalkyl with 5–8 carbon atoms in the ring or phenyl,
X represents oxygen or sulphur, and
Y represents alkyl with 1–8 carbon atoms, cyano or nitro.

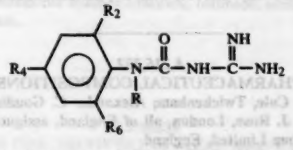
10. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a urea according to claim 1.

4,216,229
METHOD FOR TREATING GASTROINTESTINAL HYPERACIDITY OR ULCERATION WITH AMIDINOUREAS

Julius Diamond, Morris Plains, N.J., and Jerome J. Zalipsky, Melrose Park, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 554,379, Mar. 3, 1975, Pat. No. 4,150,154, which is a continuation-in-part of Ser. No. 379,626, Jul. 16, 1973, abandoned. This application Jul. 19, 1978, Ser. No. 926,054
Int. Cl.[2] A61K *31/17*
U.S. Cl. 424—322 **11 Claims**

1. A method for relieving gastrointestinal hyperacidity or ulceration comprising administering to a patient suffering from said gastrointestinal hyperacidity or ulceration a therapeutically effective amount between 0.5 mg and 500 mg per dosage unit of at least one compound of the formula:



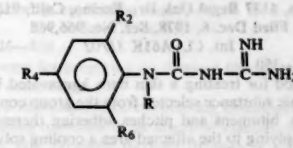
where:
R is hydrogen or loweralkyl;
R_2 is loweralkyl;
R_4 is loweralkyl; halo or loweralkoxy;
R_6 is hydrogen, loweralkyl, halo, haloloweralkyl, nitro, loweralkylsulfonyl or loweralkoxy; and
the non-toxic acid addition salts thereof.

4,216,230
METHOD FOR ALLEVIATING HYPERTENSION WITH AMIDINOUREAS

Julius Diamond, Morris Plains, N.J., and Jerome J. Zalipsky, Melrose Park, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 554,379, Mar. 3, 1975, Pat. No. 4,150,154, which is a continuation-in-part of Ser. No. 379,626, Jul. 16, 1973, abandoned. This application Jul. 19, 1978, Ser. No. 926,053
Int. Cl.[2] A61K *31/17*
U.S. Cl. 424—322 **11 Claims**

1. A method for alleviating hypertension comprising administering to a patient suffering from said hypertension a therapeutically effective amount between 0.5 mg to 500 mg per dosage unit of at least one compound of the formula:



where:
R is hydrogen or loweralkyl;
R_2 is loweralkyl;
R_4 is loweralkyl, halo or loweralkoxy;
R_6 is hydrogen, loweralkyl, halo, haloloweralkyl, nitro, loweralkylsulfonyl or loweralkoxy; and
the non-toxic acid addition salts thereof.

4,216,231

9,10-DIHYDRO-9,10-METHANOANTHRACENE N-OXIDE DERIVATIVES

Hiroshi Tanida, Osaka, and Tadashi Irie, Suita, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 750,630, Dec. 15, 1976, Pat. No. 4,153,629. This application Jan. 30, 1979, Ser. No. 7,711
Claims priority, application United Kingdom, Dec. 15, 1975, 51318/75
Int. Cl.² A01N *9/20, 9/24*
U.S. Cl. 424—330 **1 Claim**

1. A pharmaceutical composition comprising an effective anti-depressant, tranquilizing or anti-epileptic amount of the compound 9-(3-dimethylaminopropyl)-9,10-dihydro-9,10-methanoanthracene N-oxide, or a pharmaceutically acceptable acid addition salt thereof, and a pharmaceutically suitable carrier.

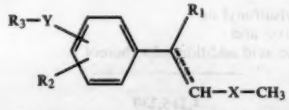
4,216,232

PHARMACEUTICAL COMPOSITIONS

William G. Cole, Twickenham; Alexander C. Goudie, Harlow, and Carl J. Rose, London, all of England, assignors to Beecham Group Limited, England

Continuation of Ser. No. 750,713, Dec. 15, 1976, abandoned, which is a division of Ser. No. 588,638, Jun. 20, 1975, Pat. No. 4,062,978. This application Feb. 17, 1978, Ser. No. 878,675
Claims priority, application United Kingdom, Jul. 4, 1974, 29651/74
Int. Cl.² C07C *49/44;* A01N *9/24*
U.S. Cl. 424—331 **8 Claims**

1. A method of treating inflammation in humans and animals which comprises orally or parenterally administering to a human or animal in need thereof an anti-inflammatory amount of a compound of the formula



(I)

wherein X is CO; Y is an oxygen atom; the dotted line represents a double bond which is present or absent; R_1 is hydrogen or methyl; R_2 is hydrogen; and R_3 is phenyl unsubstituted or or substituted by 1 or 2 substituents selected from the group consisting of fluorine, chlorine, bromine, methyl, ethyl, methoxyl, ethoxyl, benzyloxyl, hydroxyl, acetoxyl, trifluoromethyl, nitro, amino, acetyl, methylthiol, methylsulphonyl, methylamino and dimethylamino; in combination with a pharmaceutically acceptable carrier suitable for said administration form.

4,216,233

METHOD FOR TREATMENT OF SKIN BURNS IN MAMMALS

Karl N. Stein, 4137 Regal Oak Dr., Encino, Calif. 91346

Filed Dec. 6, 1978, Ser. No. 966,968
Int. Cl.² A61K *31/02*
U.S. Cl. 424—350 **6 Claims**

1. A method for treating a skin burn aggravated by a hot, molten organic substance selected from the group consisting of tars, asphalts, bitumens and pitches adhering thereto, which comprises applying to the affected area a cooling solvent consisting essentially of a halogenated, short chain aliphatic acyclic hydrocarbon substituted by at least one atom of fluorine, bromine or chlorine, and having a boiling point of from 0° to 50° C. or mixtures thereof, to soften or dissolve and remove the organic substance while cooling the affected area without further injury to the burned skin.

4,216,234

LIPID ENCAPSULATED FEED SUPPLEMENT AND PROCESS FOR PRODUCING SAME

Robert M. Rawlings, and Donald Procter, both of Boise, Id., assignors to Blue Wing Corporation, Boise, Id.

Continuation of Ser. No. 665,004, Mar. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 649,808, Jan. 16, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,346
Int. Cl.² A23K *1/04, 1/08*
U.S. Cl. 426—2 **12 Claims**

1. A process of feeding ruminant animals a feed supplement comprising:
(1) feeding the ruminant animals a composite feed supplement comprising a nutrient composition in an amount effective to increase milk fat, meat and milk production without causing digestive disturbance made by the process consisting of:
(a) adjusting the pH to from about 9.6 to about 12.5 of an aqueous medium containing blood or milk whey in a sufficient amount to provide at least about 6 weight percent albumin;
(b) dispersing globules of a nutrient lipid within said aqueous medium in an amount in the range of from about 5 to about 20% of the resulting dispersion;
(c) heating the resulting dispersion at a temperature effective to form a gel;
(d) recovering said gel of said nutrient lipid microencapsulated by said albumin; and
(2) allowing the supplement to be ingested by the ruminant animals and passed through the rumen and become digested in the abomasum and lower gut and thereby assimilated by the ruminant animals.

4,216,235

ELIMINATION OF FLATULENT SUGARS FROM SOY

Jaroslav Dasek, Yverdon; David Shepherd, Morges, and Robert D. Wood, Le Mont-sur-Lausanne, all of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Dec. 7, 1978, Ser. No. 967,489
Claims priority, application Switzerland, Jan. 4, 1978, 69/78
Int. Cl.² A23L *1/20*
U.S. Cl. 426—46 **8 Claims**

1. A process for eliminating the flatulent sugars present in soya which comprises preparing an aqueous soya suspension containing from 5 to 45% by weight of dry matter, inoculating the suspension thus prepared with at least one strain of *Saccharomyces (S.) cerevisiae* or *S. uvarum* of which the inoculum was prepared on a medium wherein the principal carbon source is glucose or saccharose, in combination with at least one strain of *S. uvarum* of which the inoculum was prepared on a medium containing at least one sugar having at least one α-D-galactopyranosyl bond and fermenting the suspension under anaerobic conditions for at least 8 hours at a temperature of from 15° to 50° C.

4,216,236

INFANT MILK FORMULA AND PROCESS FOR ITS MANUFACTURE

Hans R. Müeller, St. Legier, and Marie-Christine Secretin, Blonay, both of Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Apr. 11, 1978, Ser. No. 895,497

Claims priority, application Switzerland, Apr. 27, 1977, 5216/77

Int. Cl.[2] A23C *11/00*

U.S. Cl. 426—72 9 Claims

7. A process for the production of a food product for babies of low birth weight, comprising the steps of:

(a) clarifying fresh milk;

(b) adding lactic fat to the clarified fresh milk;

(c) further adding non-lactic fats to the mixture of clarified fresh milk and lactic fat;

(d) pasteurizing, concentrating, homogenizing and cooling the resulting milk mixture;

(e) adding substantially demineralized whey and essentially non-denatured ultrafiltered soluble whey proteins to the milk mixture;

(f) preheating and drying the milk mixture under conditions which do not denature the proteins to obtain a powder;

(g) mixing the powder with an anhydrous glucose donor to form the food product; and then

(h) storing the resultant food product in the absence of oxygen wherein the said resultant food product comprises the following substances per 100 parts by weight of dry material:

21–27 parts of lipids containing, by weight, 45 to 50% of lactic fat, 9 to 15% of vegetable fat and 35 to 45% of medium chain triglycerides, linoleic acid representing 8 to 13% of the total fatty acids,

13–16 parts of milk proteins, at least 50% by weight of which are soluble proteins,

50–63 parts of carbohydrate sugars consisting of a mixture of lactose and of a glucose donor other than lactose,

1.5–2 parts of mineral salt and

1–3 parts of water.

4,216,237

POTASSIUM-SUPPLEMENT COMPOSITION

Walton J. Smith, Rte. 4, Grafton, N.H. 03240

Continuation-in-part of Ser. No. 835,966, Sep. 23, 1977, abandoned. This application May 11, 1978, Ser. No. 904,888

Int. Cl.[2] A23L *1/30, 1/22, 1/237*

U.S. Cl. 426—74 5 Claims

1. A dry, potassium-supplement composition consisting essentially of from 10 to 50% by weight potassium chloride and a balance of from 25 to 50% by weight of the balance of a water-soluble carbohydrate, foodstuff ingredient selected from the group consisting of sugar, a non-hydroscopic starch hydrolysate and a mixture thereof and from 50 to 75% by weight of the balance of an organic, potassium-containing foodstuff ingredient at least half of which is milk solids selected from the group consisting of cocoa, powdered tomato and ground nuts.

4,216,238

DIALKYL AMINO ETHYL AMIDES, THEIR SALTS AND THEIR USE AS ANTI-RIPENING AGENTS

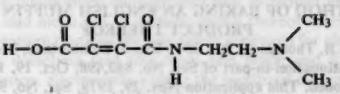
Don R. Baker, Orinda, and Daniel L. Hyzak, Saratoga, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 839,468, Oct. 4, 1977, abandoned. This application Feb. 13, 1979, Ser. No. 11,814

Int. Cl.[2] A23L *3/34;* C07C *103/66*

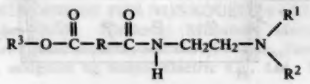
U.S. Cl. 426—321 7 Claims

1. The compound having the structural formula



or a salt thereof wherein the anion is chloride, bromide, acetate, sulfate or phosphate.

2. A method for retarding the ripening of bananas comprising contacting said bananas with a compound having the structural formula



in which R is alkylene having 1 to 4 carbon atoms, vinylene, 1,2-dihalo vinylene, 1-methyl vinylene, and ethylidene; R^1 and R^2 are independently alkyl having 1 to 4 carbon atoms, and R^3 is hydrogen or alkyl having 1 to 6 carbon atoms or a salt thereof wherein the anion is chloride, bromide, acetate, sulfate or phosphate.

4,216,239

PROCESS FOR RECOVERING MEAL AND FAT FROM ANIMAL RAW MATERIALS

Einar Gloppestad, Tumba, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Mar. 20, 1978, Ser. No. 888,316

Claims priority, application Sweden, Mar. 22, 1977, 7703258

Int. Cl.[2] A23L *1/31, 1/325*

U.S. Cl. 426—456 1 Claim

1. In the recovery of meal and fat from an animal raw material, the process comprising the steps of boiling said raw material, subjecting said material, directly after the boiling step, to a first centrifugal separation in a centrifugal separator having a rotating conveyor screw and three separate outlets including a first outlet through which a liquid fat phase is discharged, a second outlet through which stick-water is discharged, and a third outlet through which a sludge phase is discharged, subjecting said sludge phase and stick-water to a mixing operation in a mixer to form an intimate mixture of said sludge phase and stick-water, and then removing sludge from said mixture by subjecting said mixture to a second centrifugal separation.

4,216,240

PROCESS FOR PREPARING FIBROUS PROTEIN FOOD PRODUCTS

Mitsuru Shirai; Katsutoshi Okamura, both of Yokohama; Shigeru Toba, Kawasaki; Shundo Harada, Kawasaki, and Yaeko Mitsuura, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 813,345, Jul. 6, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,530

Claims priority, application Japan, Jul. 9, 1976, 51-81628

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—516 8 Claims

1. A process for preparing an oriented fibrous protein product which comprises:

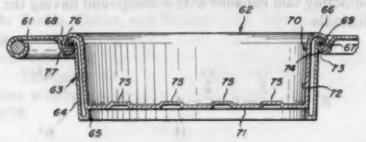
holding a flowable mixture consisting essentially of protein containing materials in an injection machine and then

injecting said flowable mixture through a nozzle at ram pressures between 1000 and 2000 kg/cm^2 into an environment at substantially atmospheric pressure or into a mold.

4,216,241
METHOD OF BAKING AN ENGLISH MUFFIN AND PRODUCT THEREOF

Jerome B. Thompson, Box 231 - Rte. 3, Cumberland, Md. 21502

Continuation-in-part of Ser. No. 843,498, Oct. 19, 1977, abandoned. This application Nov. 29, 1978, Ser. No. 964,509
Int. Cl.[2] A21D *13/00, 8/06;* A21B *5/02*
U.S. Cl. 426—549 3 Claims



1. The method for producing English muffins by a baking procedure in a bun baking oven comprising preparing a conventional English muffin dough formulation, dividing the dough formulation into a plurality of individual dough pieces, flattening the individual dough pieces to a desired thickness, placing the flattened dough pieces into individual cup means present in baking pan means, the portion of said cup means in direct contact with said dough pieces being insulated from direct contact with the heat generated by the baking oven, placing perforated cover means over said baking pan means and in direct engagement with the top surface of said cup means, said cover means being perforated to an extent such that a considerable portion of the cover means will be open thus exposing a considerable area of the dough pieces to the direct heat of the baking oven, but the size and configuration of the perforations in the cover means are such that the dough will not rise or extrude through the openings to a point above the top surface of the cover means, said cover means being of a weight sufficient to remain in contact with the top surface of said cup means during the entire baking operation, baking the dough pieces in a bun baking oven at a temperature and for a period of time sufficient to complete the baking of the dough pieces, removing cover means from the baking pan upon the completion of the baking thereof producing baked English muffins having a pattern on the top surface thereof corresponding to the pattern of the perforations of the cover means, and thereafter removing the baked English muffins from the cup means.

4,216,242
MICROCRYSTALLINE CELLULOSE IN FREEZABLE-GEL-CONFECTION COMPOSITIONS

Amiel Braverman, 5664 Darlington Rd., Pittsburgh, Pa. 15217

Continuation-in-part of Ser. No. 828,929, Aug. 29, 1977, Pat. No. 4,140,807. This application Jan. 17, 1979, Ser. No. 4,153
Int. Cl.[2] A23G *9/00*
U.S. Cl. 426—573 23 Claims

1. An edible, room-temperature storable, virtually-syneresis-free, stable, opaque, flavored, solid-particle-containing confection composition having a liquid to pudding-like consistency at room temperature and comprising:

(a) an effective amount of peptized-microcrystalline-cellulose-containing stabilizer suitable to suspend and stabilize the solid particles, to permit ambient cooling from a microbiocidal temperature without refrigeration and without physical deterioration, to minimize syneresis, to thicken the composition and to produce a chewy and substantially non-crystalline product when said composition is frozen;

(b) from 0.08 to 0.2 percent by weight of preservative;

(c) sufficient flavoring to impart flavor to the composition;

(d) from 20 to 38 percent by weight of sweetener;

(e) sufficient water to impart to the composition a density in the approximate range of from 20° to 40° Brix; and

(f) sufficient acid to adjust the pH of the composition within the range of from about pH 3.0 to about 5.0.

4,216,243
YOGURT BEVERAGE AND METHOD FOR MANUFACTURE THEREOF

Lawrence F. Hermann, Buffalo Grove, Ill., assignor to Kraft, Inc., Glenview, Ill.

Filed Oct. 12, 1978, Ser. No. 950,788
Int. Cl.[2] A23C *9/12*
U.S. Cl. 426—583 13 Claims

1. A process for manufacture of a fluid yogurt composition comprising providing an aqueous base mix of non-fat milk solids, fat and sugar, pasteurizing and homogenizing said base mix, innoculating said base mix with a yogurt culture, fermenting said base mix to provide a coagulum, breaking said coagulum by agitating said coagulum to provide a fluid yogurt, adding to the fluid yogurt a stabilizing composition in an amount of from about 0.15 percent to about 0.40 percent by weight of said fluid yogurt, said stabilizing composition comprising xanthan gum and guar gum and pasteurizing and homogenizing said stabilized fluid yogurt to stop any further fermentation and to provide a fluid yogurt composition having an extended shelf life with a lessened tendency to separate.

4,216,244
LOW SODIUM SALT SEASONING

Alfred E. Allen, Jr., deceased, late of Bothell, Wash., and John W. Day, executor, Mercer Island, King County, Wash. 98040

Continuation-in-part of Ser. No. 796,529, May 13, 1977, abandoned, which is a continuation of Ser. No. 698,048, Jun. 21, 1976, abandoned. This application Sep. 19, 1978, Ser. No. 943,758
Int. Cl.[2] A23L *1/237*
U.S. Cl. 426—649 1 Claim

1. A low sodium salt seasoning consisting by weight of a mixture of about 90% low sodium salt base and about 10% low sodium diluent,

said base consisting by weight of a mixture of about 92% potassium chloride, about 3% L-glutamic acid, about 1% each of monopotassium glutamate, potassium citrate and potassium phosphate, and about 1% of an anti-caking agent.

4,216,245
METHOD OF MAKING PRINTED REAGENT TEST DEVICES

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 779,824, Mar. 21, 1977, abandoned, which is a division of Ser. No. 701,403, Jun. 20, 1976, Pat. No. 4,046,513. This application Jul. 25, 1978, Ser. No. 927,892
Int. Cl.[2] G01N *31/22*
U.S. Cl. 427—2 8 Claims

1. In a method for preparing a dip-and-read test device for determining the presence of a constituent in a test sample, whereby said method comprises incorporating a carrier matrix with a reagent system comprising first and second reactants, said reactants mutually interacting in the presence of said

constituent to produce a detectable response, the improvement which comprises

preparing a first reactant ink containing said first reactant, and a second reactant ink containing said second reactant,

printing said first ink onto said carrier matrix in a first array of impressions, and

printing said second ink onto said carrier matrix in a second array of impressions, the impressions of said second array being printed so as to be at least partially interspersed with, but substantially not contacting, the impressions of said first array.

4,216,246

METHOD OF IMPROVING ADHESION BETWEEN INSULATING SUBSTRATES AND METAL DEPOSITS ELECTROLESSLY PLATED THEREON, AND METHOD OF MAKING ADDITIVE PRINTED CIRCUIT BOARDS

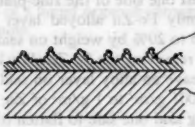
Yorio Iwasaki; Toshiro Okamura, both of Shimodate; Akishi Nakaso, Oyama; Nobuo Uozu, Shimodate, and Hiroshi Takahashi, Kasama, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,398

Claims priority, application Japan, May 14, 1977, 52-55789; May 14, 1977, 52-55790

Int. Cl.² B05D *3/06*

U.S. Cl. 427—43.1 **6 Claims**



1. A method of rendering the surface of an insulating substrate adhesive and catalytic to a metal deposit electrolessly plated thereon which comprises the steps of:

(1) forming on the surface of an insulating substrate a layer of an adhesive material comprising (A) a rubber material selected from the group consisting of an acrylonitrile-butadiene copolymer, polychloroprene, polybutadiene and mixtures thereof and (B) a thermosetting resin selected from the group consisting of a bisphenol A type epoxy resin, a novolak type epoxy resin, an alicyclic glycidyl ether resin, a resol type phenolic resin, a novolak type phenolic resin, an alkylphenolic resin and mixtures thereof, the component (B) being dispersed, in the form of substantially spherical particles having a particle diameter of 0.5 to 15μ, in a continuous phase of the component (A) and present in a proportion defined by the formula $20 \leqq (B)/(A)+(B) \leqq 85\%$ by volume, and having an Solubility Parameter value 1 to 4 higher than that of said component (A);

(2) subjecting the adhesive material to heat-curing treatment; and

(3) treating the layer surface of the heat-curing treated adhesive material with an oxidizing agent to effect etching of the component (A) whereby the heat-cured particles of the component (B) appear in the surface of said adhesive material layer; the oxidizing agent-treated layer surface being sensitized for electroless plating by applying catalyst nuclei onto said oxidizing agent-treated layer surface after the step (3).

5. A method of making a printed circuit board in accordance with the method of claim 1, which comprises, following step (3), treating said oxidizing agent-treated layer surface of the substrate with a solution of a radiation sensitive composition comprising a reducible salt of a metal capable of serving as a catalyst for electroless plating of a conductor metal, a radiation-sensitive reducing agent for said salt and a secondary reducer in an acid-containing liquid medium thereby to deposit on said oxidizing agent-treated layer of the substrate a layer of the radiation-sensitive composition; attaching a film having a negative image of the circuit pattern onto the treated layer surface of the substrate; exposing said layer of the radiation-sensitive composition through said film to radiant energy to reduce said metal salt to metallic nuclei thereof whereby the circuit pattern portions are selectively sensitized for electroless plating; detaching said film from said layer; and following sensitization, electrolessly plating the sensitized circuit pattern portions of the substrate surface with a conductor metal to build up the conductor portions of the circuit to a desired thickness.

4,216,247

METHOD OF MANUFACTURING POSITIVE ELECTRODE FOR NONAQUEOUS CELL

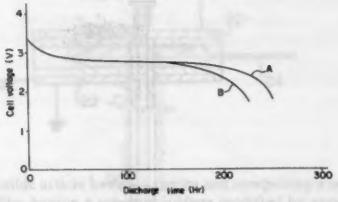
Hironosuke Ikeda, Hirakata; Mitsunori Hara; Satoshi Narukawa, both of Kobe, and Hiroji Maeda, Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 6, 1978, Ser. No. 940,095

Claims priority, application Japan, Sep. 20, 1977, 52/114072

Int. Cl.² B05D *5/12, 3/02, 3/12*

U.S. Cl. 427—115 **4 Claims**



1. A method of manufacturing positive electrodes for nonaqueous cells, comprising the steps of,

adding to manganese dioxide active material powder, a binder and a viscous agent solution decomposable at temperatures lower than the melting point of said binder, thereby to form paste,

applying said paste to a supporting member, and

heat-treating said paste-applied supporting member firstly at the decomposition temperature of said viscous agent in an oxidization atmosphere and secondly at the melting point of said binder under vacuum or in an inert atmosphere.

4,216,248

4-ALKOXY-5-(N,N-DIALKYLAMINO)-2-[(2,5-DICHLOROPHENYL)AZO]ACYLANILIDES

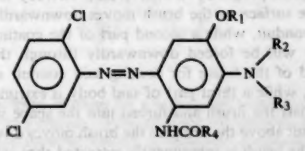
Russel I. Steiner, Reading, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed May 31, 1978, Ser. No. 911,121

Int. Cl.² B41M *5/18, 5/26;* **C09B** *29/26*

U.S. Cl. 427—148 **3 Claims**

1. A transfer sheet comprising a flexible nontextile substrate in sheet, roll or web form having an all-over or discontinuous printed pattern effect thereon, said pattern being formed by a film of a dried ink formulation adapted for heat transfer printing of synthetic textiles and wherein the ink film contains an azo acylanilide of the formula:



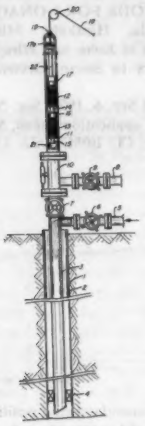
wherein R_1, R_2, R_3 and R_4 are alkyl and are the same or different.

4,216,249

METHOD AND MEANS FOR COATING THE INTERIOR OF A VERTICALLY DISPOSED ELONGATE HOLLOW MEMBER

Donald W. Clayton, Lafayette, La., assignor to Champion Chemicals, Inc., Houston, Tex.

Filed Oct. 11, 1977, Ser. No. 840,831
Int. Cl.[2] B05D 7/22
U.S. Cl. 427—230 4 Claims



1. A method of coating the inner surface of a tubular well conduit at least partially subterrainean and disposed with its longitudinal dimension having a substantial vertical component, which method comprises:

(a) placing a body of fluid coating material within and adjacent the upper extremity of said conduit in an amount sufficient to coat said inner surface,

(b) lowering into said member a bristle type brush of an outer size and contour to provide complete circumferential close-bristle proximity to said surface within normally-to-be expected variations of the inner cross section of said conduit, while also providing fluid flow clearances for passage of fluid longitudinally past said brush in said conduit,

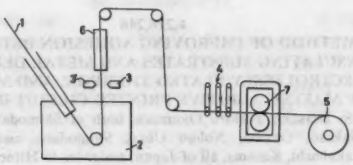
(c) forcing said brush downwardly against said coating material body at a rate faster than said body would move through the conduit under influence of gravity alone, whereby a first part of said body will be forced by the brush against the inner surface of said conduit around the complete periphery of said brush, whereby to coat said entire surface as the brush moves downwardly through the conduit, while a second part of the coating material body will be forced downwardly through the conduit ahead of the brush for coating said conduit at a lower level, while a third part of said body is extruded around and past the brush and forced into the space within said conduit above the brush as the brush moves downwardly, and the brush is subsequently retracted thru said conduit from the bottom to the top to accomplish a second application of material to said surface.

4,216,250

METHOD FOR PRODUCING A STEEL SHEET HAVING A ZINC COATING ON ONE SIDE

Motohiro Nakayama, Aichi, and Kazutsugu Nakajima, Tokai, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,737
Claims priority, application Japan, May 19, 1976, 51-57611; Nov. 12, 1976, 51-136075; Mar. 23, 1977, 52-31725
Int. Cl.[2] B05D 3/12
U.S. Cl. 427—289 10 Claims



1. A method for producing a steel sheet coated with zinc or a Fe-Zn alloy on one side comprising:

(a) zinc-plating both sides of the steel sheet;

(b) heating at least one side of the zinc-plated steel sheet to form a uniformly Fe-Zn alloyed layer having an iron content from 6 to 20% by weight on said one side;

(c) mechanically removing the Fe-Zn alloy layer on said one side so as to leave an alloy layer on said one side corresponding to 0.001 g/m^2 to 1 g/m^2 of Zn; and then

(d) temper-rolling said one side to flatten it.

4,216,251

METHOD OF PRODUCING A LEATHER-LIKE SHEET MATERIAL HAVING A HIGH-QUALITY FEELING

Takeo Nishimura, and Kazundo Akamata, both of Okayama, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 18, 1978, Ser. No. 934,894
Claims priority, application Japan, Sep. 5, 1977, 52/107116; Sep. 5, 1977, 52/107117
Int. Cl.[2] B29G 5/00; B29D 3/02, 9/08
U.S. Cl. 427—370 12 Claims

1. A method for producing an improved leather-like sheet material which comprises providing a substrate having a porous coating layer with a nonporous layer A of a polymer, pressing the substrate against a smooth surface at a temperature of 120° to 180° C. with the layer A in contact with said smooth surface, the temperature of said smooth surface being so controlled that it lowers gradually from the point of pressing to the point of peeling off, the temperature at the point of peeling off being in the range of 30° to 120° C. and the temperature difference between the point of pressing and the point of peeling off being at least 20° C., subjecting the substrate surface continuously to smoothening and thermal setting under said temperature conditions, peeling off the substrate from said smooth surface, and providing the smoothened substrate with a nonporous layer B of a polymer.

4,216,252

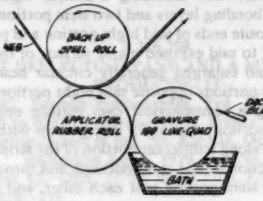
SOLVENTLESS RELEASE COATING

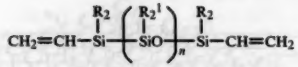
Richard E. Moeller, Troy, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 18, 1974, Ser. No. 533,959
Int. Cl.[2] B05D 3/02, 1/28
U.S. Cl. 427—387 1 Claim

1. A method for coating a substrate with from 0.1 to 2.0 lbs. per 3000 ft^2 of a solvent free silicone composition which consists essentially of:

(a) a vinyl chain-stopped polysiloxane having the formula:





wherein R and R^1 are monovalent hydrocarbon radicals free of aliphatic unsaturation with at least 50 mole percent of the R and R^1 groups being methyl and n has a value sufficient to provide a fluid material having a viscosity of from 200–5000 centipoises at 25° C.;

(b) a platinum catalyst;

(c) an amount of a liquid organohydrogenpolysiloxane having the formula:

$$(R)_a (H)_b SiO_{\frac{4-a-b}{2}}$$

sufficient to provide from about 0.5 to 1.0 silicon-bonded hydrogen atoms per silicon-bonded vinyl group in the composition, wherein R is as defined above, a is from 1.00 to 2.10, b is from about 0.1 to 1.0 and the sum of a plus b is from 2.00 to 2.67, there being at least 2 silicon bonded hydrogen atoms per molecule; and

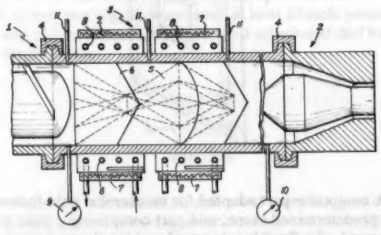
(d) a cure inhibitor which prevents premature curing of the silicone composition; said method comprising applying said silicone composition to a substrate with a two roll offset gravure coating machine having an applicator roll and a gravure roll, wherein the applicator roll is run at the same speed and in the same direction as the paper and ratio of the gravure roll linear velocity to the paper speed is between 0.1 and 0.9, and thereafter heating the coated paper to cure said silicone composition.

4,216,253

MOLDING PROCESS FOR THE FABRICATION OF HOLLOW SHAPED ARTICLES

Claude Bonnebat, Pontault Combault, and Gerard Haina du Fretay, Saint-Michel sur Orge, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Dec. 7, 1977, Ser. No. 858,273
Claims priority, application France, Dec. 9, 1976, 76 37101
Int. Cl.² B29D *23/04*; B29C *17/07*
U.S. Cl. 428—35 **19 Claims**



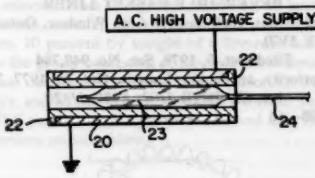
1. In a process for the manufacture of hollow-shaped thermoplastic articles comprising forming a molten mass of thermoplastic polymer, extruding said mass and subsequently forming the extruded thermoplastic into a hollow-shaped article, the improvement comprising cooling the molten thermoplastic mass from its original temperature T_0, which is above its temperature of complete fusion T_{FF}, to a temperature T_1 which is between temperature T_{FF} and the temperature of the beginning of crystallization T_{DC}, prior to entry into the extrusion die.

4,216,254

METHOD OF SELECTIVELY TREATING A PLASTIC FILM SURFACE TO PREVENT BLOCKING

Edwin O. Lundell, North Plainfield, and Walter H. Smarook, Bridgewater, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 5, 1979, Ser. No. 36,693
Int. Cl.² B29C *27/04*; B32B *31/12*
U.S. Cl. 428—35 **41 Claims**



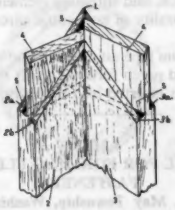
34. A flexible article having a cavity and comprising a plastic film, said film having a selected surface modified by exposure of said surface to a corona-type discharge treatment conducted in an atmosphere consisting essentially of a noble gas, under conditions of power and time sufficient to substantially prevent film blocking, wherein said film comprises a polymer selected from the group consisting of those ethylene homopolymers and copolymers which are capable of withstanding said discharge treatment without suffering substantial polymer degradation in the bulk of the film.

4,216,255

STRUCTURAL ELEMENT FOR THREE-DIMENSIONAL OBJECTS, E.G. FURNITURE

Robert J. A. B. Lever, Veerstraat 2, Schoonhoven, Netherlands

Filed May 31, 1978, Ser. No. 911,154
Claims priority, application Netherlands, Jun. 16, 1977, 7706669
Int. Cl.² F16B *12/44*
U.S. Cl. 428—57 **10 Claims**



1. A structural element for erecting, with one or more similarly formed elements, three dimensional objects comprising an elongated member having at least two longitudinal planar legs, associated pairs of said legs being joined along one longitudinal edge angularly to each other to define inner and outer surfaces with respect to the angle so formed, each of the associated legs, at at least one common end, being formed with inner

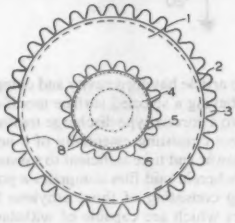
and outer end walls adjacent the inner and outer surfaces, respectively, said inner and outer end walls being chamfered from the joined longitudinal edge outwardly to the opposite longitudinal edge at a predetermined angle with the longitudinal axis and having a tenon projection and a corresponding mortise, the tenon and mortise of one leg of the associated pair being disposed oppositely to those of the other leg of the associated pair with respect to the inner and outer walls such that in one leg the mortise lies adjacent the outer end wall and the tenon lies adjacent the inner end wall and in the other leg the mortise lies adjacent the inner end wall and the tenon lies adjacent the outer end wall, the tenon of each one of the associated legs being chamfered respectively at said predetermined angle so as to lie in the plane of the end walls of the other of the associated legs whereby on joining at least two of said elements the tenons of one leg of one element fit within the mortise of one leg of the other element and the chamfered end walls abut each other.

4,216,256

REVERSIBLE BASKET LINER

Renate G. Lindner, 1569 Central Ave., Windsor, Ontario, Canada (N8Y 3V7)

Filed Oct. 5, 1978, Ser. No. 948,784
Claims priority, application Canada, Oct. 25, 1977, 289474
Int. Cl.[2] B32B *3/02*; A45C *11/20*
U.S. Cl. 428—66 **2 Claims**



1. A liner for bread baskets comprising:

a pair of circular sections of relatively stiff fabric material stitched together back-to-back at their edges to form two reversible faces for said liner;

an ornamental trim tape outlining and attached to the rim of said liner by the stitching between said circular sections;

a centrally located circular patch formed of the same general type of material as said sections and having a diameter smaller than the diameter of said sections, said circular patch being stitched to one of said faces of said liner;

an additional stiffening element of flat, circular shape and formed of relatively stiff stitchable material, located in and filling said patch, said stiffening element being held in said patch by a plurality of concentric circular paths of stitching; and

an ornamental trim tape attached to and outlining the rim of said patch, said patch forming a sfiff central base for said liner when it is inserted into a bread basket.

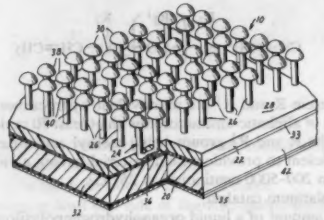
4,216,257

STRIP MATERIAL FOR FORMING FLEXIBLE BACKED FASTENERS

Ronald T. Schams, May Township, Washington County, and James N. Brown, White Bear Lake, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 20, 1979, Ser. No. 31,973
Int. Cl.[2] B32B *3/06, 5/18, 7/04*; A44B *17/00*
U.S. Cl. 428—93 **10 Claims**

1. In a strip material which may be severed into at least two lengths to form portions of a fastener, said strip material comprising a flexible nonoriented polymeric bonding layer having an exposed major surface; a multiplicity of flexible, resilient, generally U-shaped monofilaments of longitudinally oriented polymeric material, each including a central bight portion embedded in the bonding layers and two stem portions extending from the opposite ends of said bight portion and projecting generally normal to said exposed major surface of the surface bonding layer; and enlarged generally circular heads at the ends of said stem portions opposite said bight portion, each of the heads having a semispherical cam surface opposite its supporting stem portion adapted for engagement with the cam surfaces of heads along a different portion of the strip material to produce deflection of the stem portions and movement of the heads on the stem portion past each other, and having a



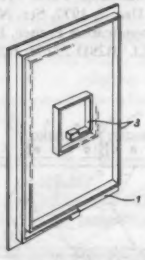
latching surface opposite said cam surface which latching surface is generally planar, extends at generally a right angle radially from its supporting stem portion, and is adapted to engage a similar latching surface on another head; the bight portions of said U-shaped monofilaments being disposed to afford movement of the heads along different portions of the strip material past and into releasable engagement with each other; the improvement wherein said strip material further includes a layer less than about 0.16 centimeter thick of low density closed cell polymeric foam having a density of less than about 0.32 grams per cubic centimeter on the side of said flexible bonding layer opposite said projecting stem portions, and a layer of soft tacky pressure sensitive adhesive on the side of said layer of foam opposite said bonding layer.

4,216,258

MECHANICALLY FORMABLE COMPOSITE PART

Simon Levine, Antony, and Alain Nakach, Gometz-la-Ville par Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 2, 1978, Ser. No. 956,894
Claims priority, application France, Nov. 4, 1977, 77 33222
Int. Cl.[2] B32B *3/10, 15/04, 15/08*; G03C *5/00*
U.S. Cl. 428—209 **5 Claims**



1. A composite part adapted for mechanical cold-formation into a predetermined shape, said part comprising a plate member formed of a flexible, electrical and/or thermal insulating material, and raised metallic portions bonded to at least one face of said plate member, the thickness of said plate member

being no greater than the thickness of the metallic portions, said metallic portions having a thickness of at least 0.3 mm.

4,216,259

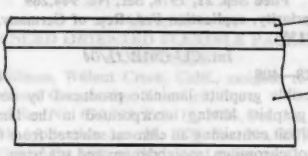
HEAT REFLECTING PANE AND A METHOD OF PRODUCING IT

Rolf Groth, Bochum-Wattenscheid, Fed. Rep. of Germany, assignor to BFG Glassgroup, Paris, France

Continuation-in-part of Ser. No. 839,938, Oct. 6, 1977. This application Jan. 2, 1979, Ser. No. 104

Int. Cl.[2] C03C *17/22*; B05D *5/06, 3/02, 3/04*

U.S. Cl. 428—216 **13 Claims**



1. A heat-reflecting pane comprising:

a substantially transparent glass substrate; and

two adjacent layers of TiO_2 on said glass substrate comprising:

an intermediate layer of TiO_2 on said glass substrate;

said intermediate layer of TiO_2 being in the anatase form; and

an outside layer of TiO_2 on said glass substrate;

said outside layer of TiO_2 being in the rutile form;

said adjacent layers having been formed by first depositing an intermediate Ti layer to said glass substrate by vapor deposition in vacuo followed by depositing an outside Ti layer to said intermediate layer of Ti by vapor deposition in vacuo and subsequently oxidizing said intermediate and outside Ti layers at a temperature of at least 400° C.

4,216,260

POLYESTER COMPOSITIONS AND ARTICLES SIZED THEREWITH

Herman T. Buckley, Columbus, Ga., assignor to Calloway Chemical Company, Columbus, Ga.

Division of Ser. No. 769,305, Feb. 11, 1977, abandoned. This application May 30, 1978, Ser. No. 910,114

Int. Cl.[2] B32B *7/00*

U.S. Cl. 428—261 **18 Claims**

1. An article of manufacture derived from paper and textile fibrous material sizes with a sizing composition containing a water-soluble salt of a linear polyester derived essentially from components

(A) at least one dicarboxylic acid component, and

(B) at least one polyol component, at least 10 mole percent of said polyol being a carboxylic acid-substituted diol having the structure:

$$\begin{array}{c} (CH_2)_xOH \\ | \\ R-C-COOH \\ | \\ (CH_2)_yOH \end{array}$$

wherein R is lower alkyl, and x and y are integers of 1 to 3, said polyester having an acid number of about 80 to 90 and a hydroxyl:carboxyl ratio of 1.3 to 1.8:1.

4,216,261

SEMI-DURABLE, WATER REPELLANT, FIRE RESISTANT INTUMESCENT PROCESS

Gil M. Dias, Fall River, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 6, 1978, Ser. No. 966,846

Int. Cl.[2] C09D *5/18*; C09K *3/18*

U.S. Cl. 428—264 **8 Claims**

1. A process for imparting an intumescent, water repellent, fire retardant finish to fabrics, which comprises applying to the fabric an aqueous dispersion of:

a. 5.9–20 percent by weight of a substantially water insoluble ammonium polyphosphate catalyst,

b. 2.6–10 percent by weight of a carbonific,

c. 2–6 percent by weight of a blowing agent selected from the group consisting of dicyanidiamide, urea, melamine or guanidine,

d. 10–20 percent by weight of an emulsion containing a chlorinated paraffin, a lower temperature blowing agent,

e. 2–12 percent by weight of viscous, water insoluble liquid solution containing 10 percent by weight of a water repellent selected from the group consisting of lead stearate, aluminum acetate, aluminum silicate and hydrocarbon waxes, 10 percent by weight of a fire-retardant selected from the group consisting of zinc borate, antimony oxide, stannic oxide and zinc oxide, 50 percent by weight of a binder, and 30 percent by weight of a solvent vehicle, and

f. 32–75.5 percent by weight of water; and then drying said dispersion on said fabric.

4,216,262

SURFACE TREATMENT OF CARBON FIBERS

John C. Goan, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed May 23, 1979, Ser. No. 41,703

Int. Cl.[2] B32B *9/00*

U.S. Cl. 428—367 **4 Claims**

1. A method for improving the bonding characteristics of carbon fibers with a resin matrix material which comprises applying to the surface of said fibers an effective amount of a coating composition consisting essentially of 4,4,4-trichloro-1,2-epoxy butane.

4,216,263

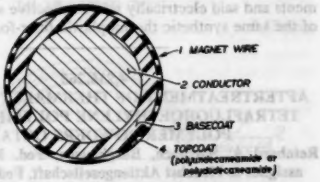
MAGNET WIRE

Harold R. Otis; Charles E. Blake, both of Fort Wayne, Ind., and Paul J. Schmidt, Payne, Ohio, assignors to Rea Magnet Wire Co., Inc., Fort Wayne, Ind.

Continuation of Ser. No. 883,231, Mar. 3, 1978, abandoned. This application May 4, 1979, Ser. No. 36,084

Int. Cl.[2] B32B *27/00*; D02G *3/00*

U.S. Cl. 428—383 **8 Claims**



4. A magnet wire bondable at an elevated temperature in the range of approximately 190° to 200° C. comprising

a conductor consisting of a single strand of wire wherein the wire is a metal selected from the group consisting of copper, aluminum and aluminum alloy;

a thermosetting modified polyester insulating basecoat adjacent to and around and along the length of the conductor;

a self-bondable topcoat adjacent to and around and along the length of the polyester basecoat wherein the topcoat is a polyamide selected from the group consisting of polyundecaneamide, polydodecaneamide and mixtures thereof, and wherein the topcoat comprises approximately 10 to 20% of the total coating thickness; and

a dry lubricant over the topcoat.

4,216,264

CONDUCTIVE COMPOSITE FILAMENTS

Tsutomu Naruse, Osaka; Takao Osagawa, Settsu; Hiroshi Naito, Osaka; Masao Matsui, Takatsuki, and Kazuo Okamoto, Osaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 931,100

Claims priority, application Japan, Aug. 8, 1977, 52/95219; Aug. 8, 1977, 52/95220

Int. Cl.² D02G *3/00*

U.S. Cl. 428—397 **15 Claims**

1. A unitary, elongated, electrically conductive, composite, melt-spun filament which in transverse cross-section consists of from 2 to 8 electrically conductive segments whose inner ends are integral with each other at a common center located in the central interior portion of the filament and which radiate outwardly from said center and extend to the perimeter of the filament with the outer ends of said electrically conductive segments being exposed on the outer surface of said filament, the spaces between said electrically conductive segments outwardly from said center being filled with electrically non-conductive segments whereby said electrically conductive segments are isolated from each other except at said center and only the outer ends of said electrically conductive segments are exposed, said electrically conductive segments having an electrical resistance of less than 1×10^{13} Ω/cm and consisting essentially of synthetic thermoplastic fiberforming polymer containing uniformly dispersed therein from 3 to 40% by weight of electrically conductive carbon black, said electrically non-conductive segments consisting essentially of synthetic thermoplastic fiber-forming polymer, said electrically non-conductive segments being continuously bonded to said electrically conductive segments along the entire length of said filament, the sum of the cross-sectional areas of said electrically conductive segments being less than 50% of the total cross-sectional area of said filament and the sum of the exposed areas of said electrically conductive segments on the surface of said filament being less than 30% of the total surface area of said filament and wherein said electrically conductive segments and said electrically non-conductive segments are made of the same synthetic thermoplastic fiber-forming polymer.

4,216,265

AFTERTREATMENT OF THERMALLY PRETREATED TETRAFLUOROETHYLENE POLYMERS AND THE POLYMER POWDERS OBTAINED

Reinhard A. Sulzbach, Burghausen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 27, 1978, Ser. No. 946,359

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744244

Int. Cl.² B32B *27/00*

U.S. Cl. 428—402 **9 Claims**

7. A presintered powder of non-melt-processable tetrafluoroethylene powder composed of, in polymerized form, tetrafluoroethylene and from 0.0002 to 0.5 mol percent, calculated on tetrafluoroethylene, of a perfluorinated modifying monomer, having a degree of sintering of substantially 100% as determined by differential thermo-analysis, an average particle diameter d_{50} of from 200 to 900 μm with no more than 15% by weight of particles with a diameter below 150 μm, a bulk density of more than 770 grams per liter and a powder flow index not higher than 3 seconds per 50 grams.

4,216,266

FLEXIBLE GRAPHITE SHEET MATERIAL TREATED WITH AN ALKALI METAL SALT CONTAINING AT LEAST ONE OF THE ELEMENTS CHROMIUM, MOLYBDENUM AND TUNGSTEN

Alfred Hirschvogel, Langweid, and Ernst Freundlinger, Meitingen, both of Fed. Rep. of Germany, assignors to Sigri Elektrographit Gesellschaft mit beschrankter Haftung, Meitingen bei Augsburg, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,269

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748135

Int. Cl.² C01B *31/04*

U.S. Cl. 428—408 **14 Claims**

1. A flexible graphite laminate produced by compacting expanded graphite having incorporated in the laminate an alkali metal salt containing an element selected from the group consisting of chromium, molybdenum and tungsten.

9. In a process for the production of a flexible graphite laminate by treating graphite with a liquid containing an oxidizing agent and subsequently heating the treated graphite to expand the treated graphite to produce expanded graphite, and subsequently compacting the expanded graphite to form a flexible graphite laminate, the improvement comprising reducing the corrosive properties of the flexible graphite laminate by incorporating in the graphite subsequent to the oxidation treatment and during or after the manufacture of the laminate, an alkali metal salt containing an element selected from the group consisting of chromium, molybdenum and tungsten.

4,216,267

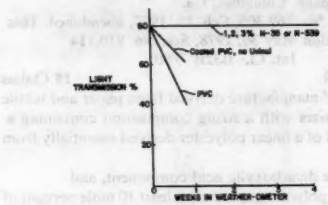
FLEXIBLE SUBSTRATES CONTAINING A RADIATION CURABLE COATING COMPOSITION

Donald H. Lorenz, Basking Ridge; Shu T. Tu, E. Brunswick, and Donald P. Wyman, Wayne, all of N.J., assignors to GAF Corporation, New York, N.Y.

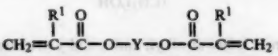
Division of Ser. No. 865,663, Dec. 29, 1977, Pat. No. 4,129,667. This application Nov. 13, 1978, Ser. No. 959,527

Int. Cl.² B32B *27/40*

U.S. Cl. 428—412 **19 Claims**



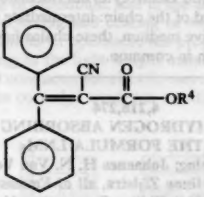
1. A laminate comprising a planar sheet of clear polyvinyl chloride with a film coating 0.1 to 10 mils in thickness comprising an acryl urethane oligomer represented by the formula:



wherein R^1 is hydrogen or methyl; Y is a divalent urethane

residue and an acrylic ultra-violet light absorber of Formula IV:

(IV)



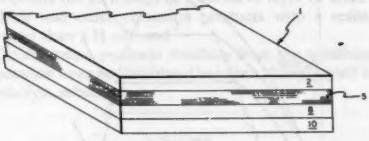
wherein R^4 is alkyl or hydroxy alkylene.

4,216,268

BALANCED ORIENTED FLEXIBLE PACKAGING COMPOSITE

Nathan Stillman, Walnut Creek, Calif., assignor to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 656,863, Feb. 10, 1976, Pat. No. 4,085,244.
This application Apr. 18, 1978, Ser. No. 897,371
The portion of the term of this patent subsequent to Apr. 18, 1995, has been disclaimed.
Int. Cl.² B32B *27/40*
U.S. Cl. 428—424.8 **6 Claims**



1. A composite, flexible packaging film comprising essentially a first layer of balanced biaxially-oriented polyamide, providing substantial flex crack resistance affixed to one side of a second layer of flexible metal foil and a third layer of balanced biaxially-oriented polypropylene, also providing substantial flex crack resistance affixed to the opposite side of said foil and to a fourth layer of heat-sealable polypropylene.

4,216,269

POLYVINYLBUTYRATE SHEET STAINING PROCESS FOR THE MANUFACTURE OF LAMINATED AND BULLETPROOF GLASS AS WELL AS PRODUCT OBTAINED BY SAID PROCESS

Roberto Tonali, Milan, Italy, and Raffaello Bertolini, Via dell-'Atleta, Este (Padova), Italy, assignors to Raffaello Bertolini, Este, Italy

Filed Aug. 2, 1978, Ser. No. 930,450
Claims priority, application Italy, Aug. 3, 1977, 26451 A/77
Int. Cl.² B05D *5/06, 5/00, 3/00, 1/18*
U.S. Cl. 428—500 **14 Claims**

1. A process for applying a stain on a sheet of polyvinylbutyrate comprising: preparing a bath comprising water and a synthetic organic stain; wrinkling the sheet and contacting the wrinkled portions of the sheet of polyvinylbutyrate with the bath; removing the sheet from the bath after a certain duration of contact; and then washing the sheet thoroughly.

3. The process of claim **1** or **2**, wherein the sheet of polyvinylbutyrate is placed on the upper and unimmersed part of a structure of oxidizing material, the structure being in partial contact with the bath.

7. The process according to claim **3**, wherein the structure consists of iron.

14. Layered or bulletproof glass, which comprises a sheet of polyvinylbutyrate that was treated according to one of claims **1, 3, 7** or **8.**

4,216,270

MACHINE PARTS OF POWDERED METAL

Gregory D. Lawless, Oconomowoc, Wis.; Joel S. Hirschhorn, Washington, D.C., and Phillip J. Andersen, Cleveland Heights, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,144
Int. Cl.² B22F *5/00*
U.S. Cl. 428—567 **7 Claims**

1. In a machine in which opposed members are in contact with one another: one of said members being of compacted sintered powdered stainless steel having a density appreciably less than theoretical density so that the porosity which remains is substantially interconnected, and said one member having a portion of its porosity, commencing at an outer surface and extending inward thereof, impregnated with a metal selected from the group consisting of bismuth and a low friction bismuth-rich alloy.

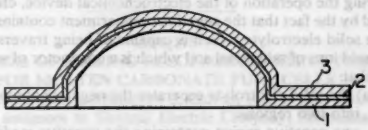
5. A machine part having a surface to be mated to an opposing part, and being fabricated as a compacted sintered powdered stainless steel part of appreciably less than theoretical density thereby to retain interconnected porosity, and impregnated for a portion of its thickness, commencing with and extending inward from an outer surface, with a metal selected from the group consisting of bismuth and a low friction bismuth-rich alloy.

4,216,271

COMPOSITE DIAPHRAGM FOR SPEAKER

Hiroshi Takeuchi, Matsubara; Hideaki Inoue, Neyagawa; Hidetsugu Kawabata, Hirakata, and Keizo Ishiwatari, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 3, 1977, Ser. No. 848,316
Claims priority, application Japan, Nov. 5, 1976, 51-133380
Int. Cl.² H04R *7/12*
U.S. Cl. 428—607 **3 Claims**



1. A composite diaphragm for a speaker comprising:

a metal foil;

a first vapor deposition layer of a material selected from a group consisting of aluminum and magnesium, formed on a surface of said metal foil, said material being different from said metal foil; and

a boron second vapor deposition layer formed on said first vapor deposition layer.

4,216,272

MULTIPLE ZINC-CONTAINING COATINGS

Richard J. Clauss, Allen Park, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 758,982, Jan. 13, 1977, abandoned. This application Jun. 2, 1978, Ser. No. 911,861
Int. Cl.² B32B *15/18*
U.S. Cl. 428—632 3 Claims

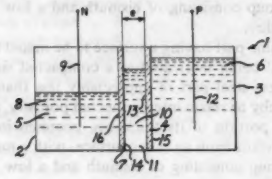
1. An article of manufacture for utilization in an environment having present therein corrosion-inducing substances, which comprises a substrate having a metal-bearing surface of steel or iron, and a plurality of superimposed, discrete, zinc-containing layers sequentially deposited upon said metal bearing surface, the initial discrete layer in contact with said metal bearing surface, having a thickness of at least 0.05 mils and consisting essentially of zinc and from about 4.0% to 14.0% of nickel as an alloying element and a second, discrete layer deposited upon said initial layer, said second layer having a thickness of at least 0.05 mils and consisting essentially of zinc with a lower content of said nickel alloying element, ranging from 0 to about 4.0%, as compared with said initial layer.

4,216,273

ELECTROCHEMICAL DEVICE WITH SOLID SEPARATOR AND SOLID ELECTROLYTE

Francois Cadart, Ceyrat, and Alain Coulombeau, La Roche-Blanche, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Dec. 4, 1978, Ser. No. 966,398
Claims priority, application France, Dec. 15, 1977, 77 38168
Int. Cl.² H01M *10/44*
U.S. Cl. 429—50 12 Claims



1. Electrochemical device comprising at least one cell, said cell having, on the one hand, at least one negative compartment containing a negative medium formed at least in part of at least one metal of groups 1a, 2a, 2b, 3a of the periodic classification of elements, said metal being in liquid state under the operating conditions of the device, and, on the other hand, at least one positive compartment containing a positive medium formed at least in part by at least one material selected from the group consisting of chalcogens, compounds of chalcogens with said metal or with transition metals, halides of transition metals, said negative and positive compartments being separated by a solid separator which is capable of being traversed only by ions of said metal and is a conductor of said ions, during the operation of the electrochemical device, characterized by the fact that the negative compartment contains at least one solid electrolyte which is capable of being traversed only by said ions of said metal and which is a conductor of said ions, so that:

(a) the solid electrolyte separates the negative compartment into two regions:

one negative region containing the negative medium and at least one negative collector,

one intermediate region, located between the separator and the electrolyte, so that during the operation of the device the transfer of metal from one of these regions to the other remains assured by mere ionic migration through the electrolyte;

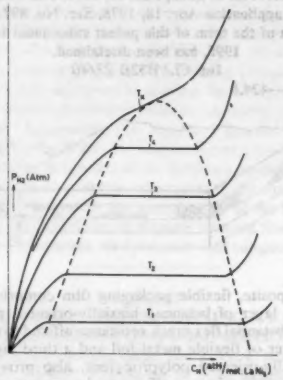
(b) the intermediate region contains an intermediate medium formed at least in part by at least one material selected from the group consisting of said metal in liquid state and the salts of said metal in dissolved or molten state; the device thus resulting from the placing in series of two electrochemical systems, one formed of the chain: negative medium/solid electrolyte/intermediate medium, and the other formed of the chain: intermediate medium/solid separator/positive medium, these chains having the intermediate medium in common.

4,216,274

BATTERY WITH HYDROGEN ABSORBING MATERIAL OF THE FORMULA LNM_5

Hugo A. C. M. Bruning; Johannes H. N. Van Vocht; Frans F. Westendorp, and Hinne Zijlstra, all of Emmasingel, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 673,220, Apr. 2, 1976, abandoned, which is a continuation of Ser. No. 247,454, Apr. 25, 1972, abandoned, which is a continuation of Ser. No. 867,811, Oct. 20, 1969, abandoned. This application Feb. 14, 1977, Ser. No. 768,211
Claims priority, application Netherlands, Jan. 24, 1969, 6901276; Apr. 25, 1969, 6906305
Int. Cl.² H01M *10/52*
U.S. Cl. 429—57 6 Claims



1. A battery comprising a positive electrode, a negative electrode, an aqueous electrolyte and a hydrogen absorbing material consisting of a substance with the nominal formula LnM_5 in which Ln is at least one lanthanide metal and M is at least one metal selected from the group consisting of nickel and cobalt.

4,216,275

ELECTROCHEMICAL STORAGE CELL OR BATTERY

Bernd Hartmann; Wilhelm Haar, both of Sandhausen; Wilfried Fischer, Neckargemünd, and Roland Bauer, Hemsbach, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

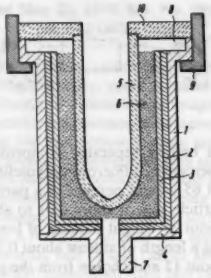
Filed Jun. 13, 1978, Ser. No. 915,132
Int. Cl.² H01M *6/20*
U.S. Cl. 429—104 2 Claims

1. In an electrochemical storage cell or battery with at least one anode chamber containing alkali metal as the anolyte and at least one cathode chamber containing a sulfur-containing catholyte substance, with the anode chamber and the cathode chamber separated from each other by an alkali-ion conducting solid electrolyte, and with the cathode chamber bounded by a cellwall of a lightweight metal having a protective layer, which wall also serves as current collector, the improvement comprising, coating the light weight metal, at least in the region which is in contact with the catholyte substance in the cathode chamber, first with a prime coat of nickel and aluminum, and then onto said prime coat applying a metallic alloy

having at least one metal selected from the group consisting of iron, cobalt and nickel, and with the alloy containing from 20 to 30 weight % of chromium, and in the absence of any additional coating covering said coating of metallic alloy which, under the conditions of operation, has properties

(a) of adhering to the light weight metal of the cellwall,

(b) of a good conductor for electric current, said alloy exhibiting, in the corroded condition resulting from conditions



of operation, a minimum conductivity of ca. 0.03 $\Omega^{-1}cm^{-1}$,

(c) prevents the formation of a cohesive layer of aluminum sulfide and other corrosion products with a resistance greater than 2 Ω cm^2 and

(d) the corrosion products resulting from the conditions of operation have a solubility of less than 10 mg/g melt in the catholyte substance.

4,216,276

ELECTROCHEMICAL STORAGE CELL

Gert Weddigen, Heidelberg-Neuenheim; Günther Ege, Mannheim, and Friedrich Vögtle, Bonn, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Jun. 22, 1979, Ser. No. 51,207

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831163

Int. Cl.² H01M *4/36*

U.S. Cl. 429—104 **14 Claims**

1. An electrochemical storage cell or battery operable in the range from about 100° C. to 200° C., comprising an alkali metal and sulfur with at least one anode chamber and at least one cathode chamber separated from each other by an alkali ion-conducting solid electrolyte, and at least one organic aprotic solvent having a boiling point above the operating temperature of the cell, contained in the cathode chamber for dissolving, at least partially, alkali compounds contained in the cathode chamber, the improvement comprising adding another organic solvent component to the cathode chamber, which solvent component is miscible with said organic aprotic solvent and also has a boiling point above the operating temperature of the cell, and in addition the solvent component is composed of at least one compound having at least one radical selected from the group consisting of N—CF_3, N—SO_2F, N—$COCH_3$, N—SO_2N, N—CO—N, N—CS—N, N—CF_2N, wherein the free nitrogen valences are saturated by one or two radicals selected from the group consisting of CH_3, $C(CH_3)_3$, $COCH_3$, CF_3, SO_2—CF_3, SO_2F, and phenyl.

4,216,277

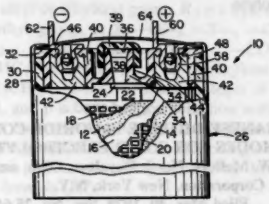
VIBRATION RESISTANT ELECTROCHEMICAL CELL

Toshio Uba, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Jun. 21, 1979, Ser. No. 50,589

Int. Cl.² H01M *2/08*

U.S. Cl. 429—175 **11 Claims**



1. In a sealed electrochemical cell having an open-mouthed container, opposite polarity electrode plates, separator interleaved between the plates, and electrolyte all within the container, and a molded lid affixed to and sealing the mouth of the container, and said molded lid including a top surface portion and at least one seat with a through bore therein, and a post connector received within the seat making a through-the-lid connection and having a strap projecting laterally from the post externally of the seat and cojoined to current collector tabs attached to the electrode plates, an improved lid providing vibration resistance to the cell comprising at least one protuberant support portion upstanding adjacent said seat and positioned to provide a mechanical support in close proximity to said laterally projecting strap.

7. A molded plastic lid for use in an electrochemical cell comprising:

a generally planar top surface portion;

at least one molded seat projecting from one side of the said lid and having a through bore therein, receiving a metal terminal post connector in the bore; and

at least one protuberant support portion upstanding from a surface of the lid and positioned to provide mechanical support in close proximity to a metal extension laterally projecting from said post.

4,216,278

PROCESS OF MAKING ELECTROLYTE STRUCTURE FOR MOLTEN CARBONATE FUEL CELLS

Ronald H. Arendt, and Matthew J. Curran, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 23, 1979, Ser. No. 14,230

Int. Cl.² H01M *8/14*

U.S. Cl. 429—188 **10 Claims**

1. A process for producing an electrolyte structure for a molten carbonate fuel cell, said electrolyte structure being comprised of electrolyte and supporting matrix, which comprises providing supporting matrix material powder wherein the particles range in size up to about 1 micron and which is at least substantially chemically inert under the operating conditions of said molten carbonate fuel cell, forming said support-

ing matrix material powder into a blank wherein the pore volume is interconnecting and comprised of capillary-sized interstices between compacted particles and is at least substantially uniformly distributed and ranges from about 50% by volume to about 70% by volume of the blank, positioning said matrix blank on a substrate so that electrolyte can be deposited on a top face thereof and gases can escape from the bottom face thereof, heating said matrix blank and electrolyte to a temperature at least about 10° K. higher than the liquidus temperature of the electrolyte but at which it does not significantly vaporize the electrolyte, contacting the resulting molten electrolyte with the top face of said matrix blank whereupon said molten electrolyte impregnates through said top face advancing throughout said matrix blank until the resulting electrolyte structure is pore free when the electrolyte is in molten form, said impregnation being carried out in an atmosphere which contains sufficient carbon dioxide gas to at least substantially maintain the stability of the molten electrolyte, said substrate being chemically non-interactive with said molten electrolyte.

4,216,279

MANGANESE DIOXIDE FLUORIDE-CONTAINING CATHODES FOR SOLID ELECTROLYTE CELLS

Geoffrey W. Mellors, North Royalton, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1979, Ser. No. 25,661
Int. Cl.[2] H01M *6/18*
U.S. Cl. 429—191 **13 Claims**

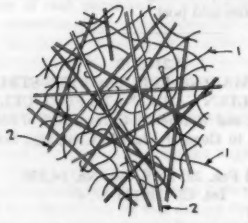
1. A cathode for use in an electrochemical cell comprising a mixture of manganese dioxide (MnO_2) having a water content of between about 1.0 and about 25 percent by weight with a metal fluoride in a mole ratio of between about 1:2.5 and about 3:1.

4,216,280

GLASS FIBER SEPARATOR FOR STORAGE BATTERIES

Migaki Kono; Hideaki Igarashi, and Kenjiro Kishimoto, all of Takatsuki, Japan, assignors to Yuasa Battery Company Limited, Takatsuki, Japan

Continuation-in-part of Ser. No. 889,958, Mar. 24, 1978, abandoned. This application Jun. 15, 1979, Ser. No. 48,902
Claims priority, application Japan, Sep. 19, 1977, 52-112883
Int. Cl.[2] H01M *2/16*
U.S. Cl. 429—247 **5 Claims**



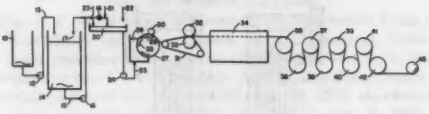
1. A separator for storage batteries comprising a sheet of entangled glass fibers, said glass fibers including 50% to 95% by weight of first glass fibers having a fiber diameter of smaller than 1 micron and 5% to 50% by weight of second glass fibers having a fiber diameter of larger than 5 microns and a fiber length of at least 5mm, said sheet including no binder.

4,216,281

BATTERY SEPARATOR

Dennis D. O'Rell, Boxboro; Nigel I. Palmer, Lexington, both of Mass., and Vu H. Nguyen, Hightstown, N.J., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Aug. 21, 1978, Ser. No. 935,280
Int. Cl.[2] H01M *2/16*
U.S. Cl. 429—252 **3 Claims**



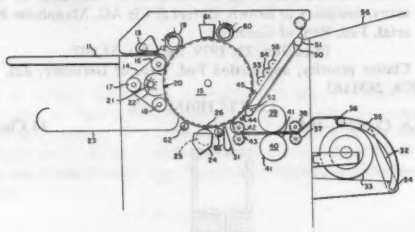
1. A lead acid battery separator comprising about 30 to about 70 weight percent of a fiberous polyolefin synthetic pulp, about 15 to about 65 weight percent of a particulate siliceous filler having a particle size of about 0.01 to about 20 microns and about 1 to about 35 weight percent of long paper making staple fiber having a length of at least about 0.25 inch, a denier of about 1.5 to about 12 and chosen from the group consisting of polyethylene terephthalate polyester fibers, acrylic fibers and mixtures thereof.

4,216,282

AC CORONA TO REMOVE BACKGROUND FROM THE IMAGING MEMBER OF A MAGNETIC COPIER

Donald W. Edwards; Emery J. Gorondy, both of Wilmington, Del., and Arend Van Roggen, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 672,558, Mar. 31, 1976, abandoned. This application Mar. 18, 1977, Ser. No. 771,381
Int. Cl.[2] G11B *5/004*
U.S. Cl. 430—39 **16 Claims**



1. A process for repetitive reproduction of graphic information comprising: (a) transferring toner particles by bringing a substrate capable of maintaining an electrostatic charge into superposed position with an image of uncharged toner particles having an electrical conductivity of less than about 1×10^{-13} mho/cm magnetically adhered to a grounded electrically conductive imaging member having a resistivity of less than about $1\times10^{+9}$ ohm-cm and applying an electric field at this position which electric field is generated by applying an electrostatic charge to the side of the substrate away from the toner particles, separating said substrate from said imaging member, whereby said toner particles adhere to said substrate upon separation of the substrate from the imaging member; (b) reapplying toner particles to the imaging member; (c) repeating step (a); (d) applying static neutralizing means selected from the class consisting of alternating current coronas and nuclear bars to said imaging member and any toner particles thereon, either between the steps of transferring toner particles to said substrate and reapplying toner particles to the imaging member, or between the steps of reapplying toner to the imaging member and bringing said substrate into superposed position with said imaging member; and (e) removing residual

toner from non-magnetized areas of said imaging member between the steps of reapplying toner to said imaging member and transferring toner to said substrate.

4,216,283

DRY TRANSFER OF ELECTROPHOTOGRAPHIC IMAGES

Sidney Cooper, Roslyn Harbor, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to Ani-Live Film Service Inc., New York, N.Y.

Filed May 23, 1977, Ser. No. 799,476
Int. Cl.[2] G03G *13/16*
U.S. Cl. 430—126 **30 Claims**

1. A xerographic process comprising depositing an electrostatic image, xerographically, upon a master dry-transfer carrier sheet, developing said electrostatic image with a dry toner composition containing a thermoplastic agent; said developed image possessing top and bottom surface and further characterized by being pressure-transferable from said carrier sheet to a receptor surface placed in contact with the top surface of said image, said dry-transfer carrier sheet being abhesive toward said developed image; contacting the top surface of said developed image with a receptor surface; and applying pressure to the non-image bearing side of said carrier sheet, whereby said image is substantially transferred from said carrier sheet to said receptor surface.

4,216,284

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tadao Sakai; Masayoshi Kawai, both of Minami-ashigara, and Tadao Shishido, Fujimiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 645,136, Dec. 29, 1975, abandoned. This application Sep. 29, 1977, Ser. No. 837,977
Claims priority, application Japan, Dec. 27, 1974, 50/680
Int. Cl.[2] G03C *7/24*
U.S. Cl. 430—140 **4 Claims**

1. A color photographic lightsensitive material which comprises a support having thereon

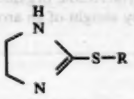
at least one blue-sensitive silver halide emulsion layer containing a yellow dye-forming coupler,

at least one red-sensitive silver halide emulsion layer containing a cyan dye-forming coupler,

at least one green-sensitive silver halide emulsion layer containing a magenta dye-forming coupler and

at least one light-sensitive silver halide emulsion layer containing

(a) at least one non-diffusible silver bleach inhibitor selected from the group consisting of (i) a nitrogen-containing heterocyclic compound having a thioether bond represented by the following general formula (I):

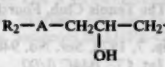


(I)

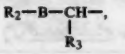
wherein R is an alkyl group having not less than 12 carbon atoms, with the alkyl group being both substituted or unsubstituted; and (ii) a nitrogen-containing heterocyclic compound represented by the following general formula (II):

(II)

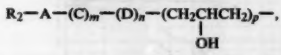
wherein Z_1 is an atomic group necessary for forming a substituted or unsubstituted pyridine nuclei, imidazole nuclei or quinoline nuclei, X^- is an anion, R_1 is a group having not less than 11 carbon atoms and is selected from the group consisting of (a) an alkyl group, (b)



(c)



and (d)



R_2 is an alkyl or alkylaryl group, R_3 is a hydrogen atom or a methyl group, A is —O—, —S—, —COO— or —NCH_3—, B is —O—, —COO—, —CONH— or —$CONHC_2H_4CONH$—, C is an oxyalkylene group, D is —CH_2CH_2— or —O—, m is an integer of 1 to 40, n is 0 or 1, and p is 0 or 1; in combination with

(b) at least one heterocyclic thione compound having a thione group which is incapable of forming a mercaptan and which is a compound represented by the following general formula (III):

(III)

wherein R_4 represents an aliphatic group, an aryl group or a heterocyclic group, and Z_2 represents an atomic group necessary to form a heterocyclic ring.

4,216,285

MONOBATH PROCESSING OF COLOR FILM, INCLUDING OPTICAL SOUND

Harris R. Miller, 60 W. 68th St., Apt. 4E, New York, N.Y. 10023

Continuation-in-part of Ser. No. 788,423, Apr. 18, 1977, abandoned. This application Jun. 26, 1978, Ser. No. 919,217
Int. Cl.[2] G03C *7/24, 5/38*
U.S. Cl. 430—140 **4 Claims**

1. A method of producing from an exposed, multi-color, photographic film element of the type containing silver halide, and suited for use in producing colored motion picture film, a composite print having thereon an unobscured dye image and an optical sound track of the dye plus silver variety, comprising,

simultaneously, developing a color dye image and a dye plus silver optical sound track on said element in an aqueous monobath, and while the element is still in the monobath, fixing the dye image and sound track without bleaching the image and sound track areas, and

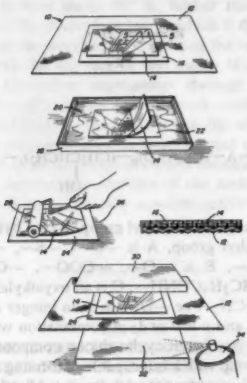
washing the developed and fixed element,

said monobath having a pH of less than 13.2, and containing in solution an aromatic amine developing agent, and an alkali metal thiosulfate fixing agent in concentrations of less than approximately 0.05 moles per liter of thiosulfate.

4,216,286
METHOD OF LAMINATING CLOTH WITH PHOTOGRAPHIC EMULSION

J. Jerrold Greene, 4094 Inverrary Dr., Lauderhill, Fla. 33319, and Avrom Keller, The Tennis Club, Fourth Ave., Ft. Lauderdale, Fla. 33339

Filed Sep. 7, 1978, Ser. No. 940,196
Int. Cl.[2] B44C 0/00
U.S. Cl. 430—203 6 Claims



1. A method of manufacturing an article comprising a composite of cloth laminated with a photographic emulsion comprising the following steps:

(a) photographing an item to be transposed onto said cloth laminate;

(b) developing said film to produce a negative and using conventional enlarging technique to produce a positive photographic enlarged print comprising an emulsion bonded to a backing paper;

(c) immersing said print in a stripping solution comprising a non-dyeing hair shampoo of low pH factor in an aqueous solution at a temperature of about 85° F. to about 100° F. and a concentration of shampoo of about 0.38% to about 0.75% by volume, whereby tearing of said emulsion is substantially preventable;

(d) stripping the emulsion from said backing paper;

(e) placing said emulsion on a sheet of protective film and smoothing said emulsion to remove excess stripping solution therefrom;

(f) coating said emulsion with a water based adhesive;

(g) placing said cloth on said coated emulsion to form a composite;

(h) drying said composite with heated forced air;

(i) placing said dried composite in press means whereby said cloth surface is exposed to an elevated press temperature;

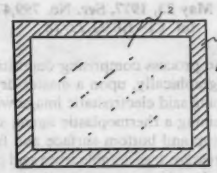
(j) pressing with said press means comprising a heated bottom plate sprayed with a vegetable oil derivative for contacting said cloth surface of said dried composite and a receiving plate for contacting said protective film surface of said dried composite, wherein said bottom plate is heated to a temperature of about 200° F. to about 240° F., said bottom plate and said receiving plate pressing said composite at a pressure of about 7500 psi for a time of about 1 to about 2 seconds; and

(k) removing said pressed composite from said press means, whereby permanence of the composite is obtained due to the temperature and composition of the stripping solution and whereby machine washing of the composite is possible without substantial alteration of or damage to the composite.

4,216,287
PHOTO-CURABLE COMPOSITE CONTAINING A SCREEN MATERIAL IN A LIQUID RESIN

Takezo Sano, Takatsuki; Haruo Inoue, Kobe, and Akihiro Furuta, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 22, 1978, Ser. No. 888,864
Claims priority, application Japan, Mar. 26, 1977, 52/33782
Int. Cl.[2] G03C 5/00
U.S. Cl. 430—271 20 Claims



1. A photo-curable composite material which comprises a flat, flexible and photo-transmitting thin film (A); a flat and flexible film (B); a liquid photo-curable resin and a flat screen material, said films (A) and (B) being air-tightly bonded to each other at their peripheral portion thereof to form a flat inner space therebetween, said liquid photo-curable resin being disposed in said inner space to form a layer, and said screen material also being disposed in the inner space substantially in parallel with the inner walls of the films (A) and (B).

4,216,288
HEAT CURABLE CATIONICALLY POLYMERIZABLE COMPOSITIONS AND METHOD OF CURING SAME WITH ONIUM SALTS AND REDUCING AGENTS

James V. Crivello, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 841,351, Oct. 12, 1977, abandoned, and Ser. No. 781,785, Mar. 28, 1977, abandoned, each is a continuation-in-part of Ser. No. 689,247, May 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 638,982, Dec. 9, 1975, Pat. No. 4,058,401, Ser. No. 638,983, Dec. 9, 1975, and Ser. No. 638,994, Dec. 9, 1975, Pat. No. 4,069,055, each is a continuation of Ser. No. 466,374, May 2, 1974, abandoned, Ser. No. 466,375, May 2, 1974, abandoned, and Ser. No. 466,378, May 2, 1974, abandoned. This application Sep. 8, 1978, Ser. No. 940,564
The portion of the term of this patent subsequent to Nov. 6, 1996, has been disclaimed.
Int. Cl.[2] G03C 1/68; C08F 8/18, 8/34
U.S. Cl. 430—280 12 Claims

1. Heat curable compositions comprising

(A) a cationically polymerizable organic material,

(B) from 0.1 to 15% by weight of an aromatic onium salt of the formula,

$$[Y]^+[J]^-,$$

(C) from 0.5% to 25% by weight of a compound, or polymer having a molecular weight in the range of from about 80 to 2000 and consisting of at least two or more chemically combined atoms selected from the class consisting of C, H, O, S, Si, halogen atoms, transition metals and metals selected from Groups III, IV, V and VI metals, which compound or polymer is capable of lowering, or reducing the charge of the hetero atom of an aromatic onium salt initiator selected from aromatic halonium salts, aromatic Group Va onium salts and aromatic Group VIa onium salts,

where J is a counterion selected from the class consisting of MQ_d anions, where M is a metal or metalloid, Q is a halogen radical, and d is an integer from 4–6 inclusive, perchlorate,

$CF_3SO_3^-$, $C_6H_4SO_3^-$, Cl^-, Br^-, F^-, nitrate and phosphate, Y is a cation selected from the class consisting of an aromatic halonium cation,

$$[(R)_a (R^1)_b D],$$

an aroamatic Group Va cation,

$$[(R)_f (R^2)_g (R^3)_h E],$$

and an aromatic Group VIa cation,

$$[(R)_j (R^4)_k (R^5)_m G],$$

where R is a monovalent aromatic organic radical, R^1 is a divalent aromatic organic radical, R^2 and R^4 are monovalent organic aliphatic radicals selected from alkyl, cyclo alkyl and substituted alkyl, R^3 and R^5 are polyvalent organic radicals forming a heterocyclic or fused ring structure selected from aliphatic radicals and aromatic radicals with E or G, D is a halogen radical, E is a Group Va element selected from N, P, As, Sb and Bi, G is a Group VIa element selected from S, Se and Te,

"a" is a whole number equal to 0 or 2,
"b" is a whole number equal to 0 or 1,
and the sum of "a"+"b" is equal to 2 or the valence of D,
"f" is a whole number equal to 0 to 4 inclusive,
"g" is a whole number equal to 0 to 2 inclusive,
"h" is a whole number equal to 0 to 2 inclusive
and the sum of "f"+"g"+"h" is a value equal to 4 or the valence of E,
"j" is a whole number equal to 0 to 3 inclusive,
"k" is a whole number equal to 0 to 2 inclusive,
"m" is a whole number equal to 0 or 1,
where the sum of "j"+"k"+"m" is a value equal to 3 or the valence of G.

4,216,289

PROCESS FOR THE PRODUCTION OF PRINTING PLATES

Kazutaka Oda, and Yoshio Okishi, both of Kawajiri Yoshida, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 659,447, Feb. 19, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,355

Claims priority, application Japan, Feb. 19, 1975, 50/20620; Mar. 24, 1975, 50/35940

Int. Cl.² G03F 7/02; G03C 1/72

U.S. Cl. 430—302 **18 Claims**

1. A process for producing a printing plate, which comprises (1) intimately contacting an original transparency with the outermost layer of a light-sensitive printing plate precursor comprising a support having coated thereon, in order, a light-sensitive layer and an outermost layer comprising an uneven pattern of a discontinuous coating layer consisting of coated areas and uncoated areas, the height of the coated areas being about 2 to 40 microns, and the distance between the coated areas adjacent to each other is about 50 to 100,000 microns, by a vacuum adhesion method, (2) exposing said plate to actinic light through said original transparency, and then (3) removing with a developing solution either the exposed area or the unexposed area of said light-sensitive layer and substantially the entire outermost layer, thereby to prepare said printing plate.

4,216,290

COATING OF VISCOUS AQUEOUS GELATIN COMPOSITIONS ON A CONTINUOUS WEB SUPPORT

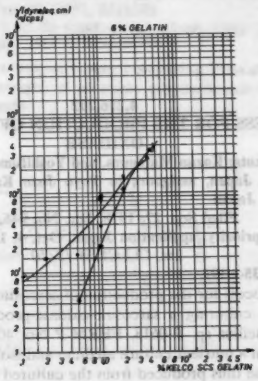
Victor F. De Beul, Mortsel, and Jan H. Van Hove, Berchem, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation-in-part of Ser. No. 759,991, Jan. 17, 1977, abandoned, which is a continuation of Ser. No. 576,739, May 12, 1975, abandoned. This application Oct. 5, 1978, Ser. No. 948,819

Claims priority, application United Kingdom, May 22, 1974, 22902/74

Int. Cl.² G03C 1/78, 1/96

U.S. Cl. 430—496 **10 Claims**



1. In a coating process in which a coating composition is forced at a given linear rate out of a narrow extrusion orifice in the form of a ribbon and received on the surface of a continuously moving support spaced from said orifice a distance of about 0.5–1.5 mm, said support travelling at a linear rate of 2–30 times the rate of extrusion of said ribbon, whereby said ribbon is stretched at the same rate in the range of 2–30 times and correspondingly attenuated as it is laid upon said web the improvement wherein said coating composition is aqueous and contains 2–20% by weight of gelatin, and the viscosity and elastic properties of said coating composition are adjusted by the inclusion therein of at least one viscoelasticity-enhancing agent in a proportion within the range of about 1–60% by weight of said gelatin and which is sufficient to impart to said coating composition a viscosity of from 136 to 1000 cps when measured at 38° C. at a shear rate of 1735 s^{-1}, and a modulus of elasticity γ of 10 to 300 dyne/sq.cm when measured at 38° C. and at 5 Hz, the corresponding range of the relaxation time τ being from 0.0045 to 1.0 s.

4,216,291

THROMBOSIS-TEST

Desire J. Collen, Winksele, Belgium, assignor to Leuven Research & Development V.Z.W., Louvain, Belgium

Continuation of Ser. No. 723,187, Sep. 13, 1976, abandoned. This application Oct. 10, 1978, Ser. No. 949,631

Claims priority, application Netherlands, Sep. 19, 1975, 7511055

Int. Cl.² C07G 7/00, 7/02; G01N 31/14, 33/16

U.S. Cl. 435—7 **8 Claims**

1. A method for purifying an antiserum which has been generated against an enzyme-inhibitor complex, said complex being part of the activated blood coagulation system or fibrinolytic system in blood plasma, comprising the steps of (a) incubating the antiserum with purified plasminogen and fresh blood plasma to form a precipitate and remaining fluid, (b) precipitating a γ-globulin fraction from said remaining fluid and (c) isolating and resuspending said precipitated γ-globulin

fraction to obtain a purified antiserum containing only antibodies specific to said enzyme-inhibitor complex.

7. A method of determining an activation of the blood-coagulation and/or fibrinolytic system in blood plasma by determining the presence of specific enzyme-inhibitor-complexes which form part of the said activated systems, comprising the steps of: contacting the blood plasma to be tested with a purified antiserum, obtained by the method of claim 1, against one of the enzyme-inhibitor complexes; subsequently contacting said blood plasma with a suspension of red blood cells or a latex of particles of synthetic resin, which cells or particles carry the particular enzyme-inhibitor-complex; and then ascertaining whether or not agglutination occurs.

4,216,292

PROCESS FOR THE PRODUCTION OF SARCOSINE OXIDASE

Shigeru Ikuta; Kazuo Matsuura, and Yoshifumi Horiuchi, all of Tagata, Japan, assignors to Toyo Jozo Kabushiki Kaisha, Tagata, Japan

Filed Sep. 27, 1978, Ser. No. 946,402
Claims priority, application Japan, Oct. 4, 1977, 52-119776
Int. Cl.[2] C12D *13/10*
U.S. Cl. 435—191 **2 Claims**

1. A process for the production of sarcosine oxidase which comprises culturing a sarcosine-oxidase-producing microorganism Bacillus sp. B-0618, FERM-P No. 4049, NRRL No. B-11380, in a nutrient culture medium and isolating the sarcosine oxidase thus produced from the cultured mass thereof.

4,216,293

EXTRACTING PROTEASE-INHIBITOR FROM ANIMAL TISSUE CONTAINING SAME

Gianfranco Fedeli, Milan, and Luigi De Ambrosi, Trino, both of Italy, assignors to Laboraton Derivati Organici, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 512,481, Oct. 4, 1974, abandoned. This application Jun. 19, 1978, Ser. No. 916,536
Claims priority, application Switzerland, Oct. 5, 1973, 14265/73
Int. Cl.[2] C07G *7/00*
U.S. Cl. 435—268 **12 Claims**

1. A method for extracting a protease-inhibitor from protease-inhibitor-containing fresh or frozen organs of slaughtered animals, said organs showing no signs of incipient or progressed azymic autolysis, said method comprising the steps of:

(a) Comminuting said organs;

(b) and before said organs show signs of incipient or progressed anzymic autolysis subjecting said comminuted organs to enzymolysis by contacting them, within an aqueous medium, with at least one proteolytic enzyme selected from the group if the proteolytic enzymes which do not naturally occur in said organs and which are inactive towards said protease-inhibitor to be extracted;

(c) Discontinuing said enzymolysis and collecting a lysate aqueous solution by subjecting the aqueous medium containing said comminuted organs and said at least one proteolytic enzyme to filtration;

(d) Adding a quaternary ammonium base to said lysate aqueous solution to obtain the precipitation of an insoluble fraction;

(e) Filtering off said insoluble fraction and collecting the inhibitor-containing filtrate, and

(f) Recovering said protease-inhibitor from said filtrate.

4,216,294

UNSATURATED POLYESTER RESIN FOAMS AND METHODS OF PREPARATION

Reidar Halle, Novato, and Ronald L. Pastorino, Larkspur, both of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed May 30, 1978, Ser. No. 910,259
Int. Cl.[2] C08J *9/02*
U.S. Cl. 521—99 **18 Claims**

1. A liquid unsaturated polyester resin composition adapted to expand and cure into a foam product having a density below about 25 pounds per cubic foot, comprising:

(a) a promoted liquid unsaturated polyester resin adapted to be crosslinked by a curing and foaming agent;

(b) a curing and foaming agent activated at ambient temperatures to effect crosslinking and curing of said polyester resin, said agent consisting essentially of similar quantities of hydrogen peroxide, an organic peroxide and an organic isocyanate present in an amount in the range of about 5% to 18% of the weight of polyester resin; and

(c) a silicone-oxyalkylene block polymer.

4,216,295

FOAMABLE RESOLE RESIN COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1976, Ser. No. 752,378
Int. Cl.[2] C08J *9/08*
U.S. Cl. 521—112 **22 Claims**

1. An improved foamable resole resin composition comprising a resole resin, a blowing agent and a surfactant, wherein the improvement comprises: said composition having present an aqueous solution of a resole resin having a pH of about 3 to 8.5 comprising:

A. a resole resin having a number average molecular weight is less than about 300, a water tolerance greater than 50%, a combined formaldehyde to phenol ratio in the range of from about 1.0:1 to 2.9:1 and,

B. a dispersion of insoluble oxalate salt particles, wherein said resole being prepared with a catalyst comprising alkaline earth metals hydroxides selected from the group consisting of magnesium, calcium, barium. strontium and mixtures thereof, said pH being adjusted with a compound selected from the group consisting of oxalic acid, ammonium oxalate and mixtures thereof providing a stable dispersion of insoluble oxalate salt particles of said alkaline earth metal ions in said solution, wherein said solution is stable to salt flocculation at a resole resin content of from about 60 to 99% by weight.

4,216,296

LOW SMOKE GENERATING POLYURETHANE FOAM

David G. Wernsing, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Jun. 26, 1978, Ser. No. 920,750
Int. Cl.[2] C08G *18/48, 18/14*
U.S. Cl. 521—175 **6 Claims**

1. A composition for the formation of polyurethane foam which has low smoke generation characteristics and which comprises, in parts by weight:

poly(trichloro-oxybutylene) carbohydrate adduct	80–100
amine-based polyol	1–20
polyalkylene polyphenyl isocyanate	80–155
fluorocarbon foaming agent	10–50
surfactant	0.3–3.0
catalyst	0.005–4.0

4,216,297

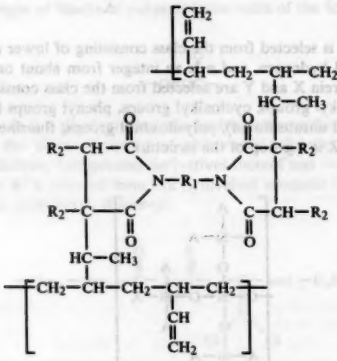
VINYL POLYBUTADIENE BISIMIDE COPOLYMERS

Robert W. Vaughan; Michael K. O'Rell, both of Manhattan Beach, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to TRW Inc., Redondo Beach, Calif.

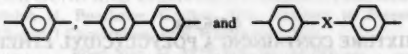
Filed Feb. 13, 1978, Ser. No. 877,127
Int. Cl.[2] C08F 8/30
U.S. Cl. 525—334 9 Claims

1. A peroxide curable resin comprising a resin system prepared from a polybutadien having a molecular weight of about 500 and 5,000 and at least 90% 1,2-polybutadiene configuration, curable through provided pendant vinyl groups in the presence of at least one provided peroxide capable of initiating cure at a temperature of at least about 300° F., said resin system comprising

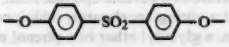
a high vinyl content polybutadiene bisimide copolymer providing pendant vinyl groups and including cross-linked segments of the general structure:



wherein R_1 is a difunctional benzenoid radical selected from the group consisting of:



wherein X is selected from the group consisting of: —O—, —S—, —SO_2—, —CH_2—, —C_2H_4—, —CO—, —C_3H_6— and



and wherein each R_2 is independently selected from the group consisting of hydrogen, an aliphatic group containing 1 or 2 carbon atoms, a benzenoid radical and a halogen.

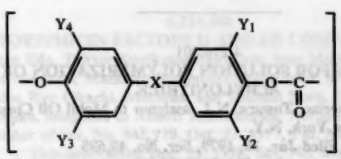
4,216,298

PROCESS FOR THE PREPARATION OF CARBONIC ACID BIS-DIPHENOL ESTERS OF POLYESTER-DIOLS AND THEIR USE FOR THE PREPARATION OF HIGH-MOLECULAR SEGMENTED POLYESTER/POLYCARBONATES WHICH CAN BE PROCESSED AS THERMOPLASTICS

Manfred Schreckenberg; Dieter Freitag, both of Krefeld; Christian Lindner, Cologne; Carlhans Süling; Herbert Bartl, both of Odenthal, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

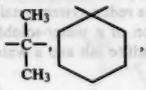
Continuation-in-part of Ser. No. 845,174, Oct. 25, 1977. This application May 24, 1978, Ser. No. 909,321
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651639; Jun. 10, 1977, 2726376
Int. Cl.[2] C08G 63/76; C08L 67/02, 69/00; C08F 283/02
U.S. Cl. 525—439 37 Claims

30. A polyester/polycarbonate comprising from about 30 to about 95% by weight of aromatic polycarbonate structural units of the formula



(III(a))

wherein
X denotes —CH_2—,



O, S or SO_2, and
Y_1 to Y_4 are identical or different and denote hydrogen or halogen,
and from about 70 to about 5% by weight of polyester-diolate block units of the simplified formula

[—O—(polyester)—O—]

wherein
-(polyester)- represents the bivalent radical of a polyester-diol.

4,216,299

COLOR DEVELOPER FOR PRESSURE-SENSITIVE COPYING PAPER

Toyoji Kikuga, and Koji Hirai, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,518
Claims priority, application Japan, Nov. 4, 1976, 51/131674
Int. Cl.[2] C08L 61/06
U.S. Cl. 525—491 6 Claims

1. A color developer for pressure-sensitive copying paper which comprises:

(1) a polyvalent metal salt of a co-condensate obtained by condensation with an aldehyde of at least one p-substituted difunctional phenol, wherein the p-substituent of said phenol is an alkyl group of 1 to 12 carbon atoms, and a tri- or higher functional phenol in an amount not exceeding about 0.6 moles with respect to 1 mole of said p-substituted difunctional phenol and

(2) a tri- or higher-functional phenol-aldehyde condensate, a

polyvalent metal-modified product thereof, or a mixture of said condensate and said metal-modified product.

4,216,300

COLOR DEVELOPER FOR PRESSURE-SENSITIVE COPYING PAPER

Toyoji Kikuga, and Koji Hirai, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Filed Nov. 1, 1977, Ser. No. 847,519
Claims priority, application Japan, Nov. 4, 1976, 51/131672
Int. Cl.² C08L 61/06
U.S. Cl. 525—491 **8 Claims**

1. A color developer for pressure-sensitive copying paper which comprises (1) a tri- or higher-functional phenol-aldehyde condensate and (2) a condensate obtained by co-condensation with formaldehyde of at least one para-substituted difunctional phenol, wherein the para-substituent of said difunctional phenol is an alkyl group of 1 to 12 carbon atoms, and a tri- or higher functional phenol in an amount of about 0.6 mole or less per mole of the para-substituted difunctional phenol.

4,216,301

PROCESS FOR SOLUTION POLYMERIZATION OF ACRYLONITRILE

Peter J. Canterino, Towaco, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 18, 1979, Ser. No. 49,695
Int. Cl.² C08F 20/44
U.S. Cl. 526—229 **4 Claims**

1. A process for polymerizing acrylonitrile that comprises carrying out the polymerization in a solution of between about 30 and about 60 weight percent acrylonitrile in dimethylsulfoxide in the presence of a redox system catalyst consisting essentially of a combination of a water-soluble bisulfite salt or a water-soluble metabisulfite salt and a water-soluble persulfate salt.

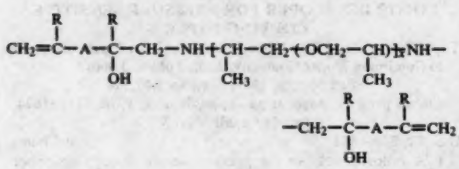
4,216,302

LIQUID VINYLIDENE-TERMINATED POLYMERS

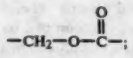
Douglas E. Skillicorn, Avon Bake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 738,195, Nov. 3, 1976, Pat. No. 4,129,713, which is a division of Ser. No. 585,962, Jun. 11, 1975, Pat. No. 4,013,710, which is a division of Ser. No. 292,926, Sep. 28, 1972, Pat. No. 3,910,992. This application Dec. 11, 1978, Ser. No. 968,233
Int. Cl.² C08F 8/34, 8/32
U.S. Cl. 526—312 **2 Claims**

1. A polymer of the formula



wherein A is a bivalent radical of the formula



R is hydrogen or an alkyl radical containing 1 to 4 carbon atoms; and n is from 5 to about 40.

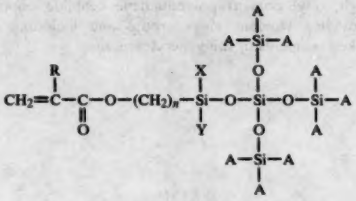
4,216,303

OXYGEN-PERMEABLE CONTACT LENS COMPOSITIONS, METHODS AND ARTICLES OF MANUFACTURE

Nick N. Novicky, Wheeling, Ill., assignor to George F. Tsuetaki, Chicago, Ill.

Filed Jan. 26, 1979, Ser. No. 6,725
Int. Cl.² C08G 77/20
U.S. Cl. 528—32 **10 Claims**

1. An oxygen-permeable plastic material particularly adapted for use in the manufacture of contact lenses, said material comprising the reaction product of from about 30% to about 45% by weight of a monomer having the following structure:



wherein R is selected from the class consisting of lower alkyl groups and hydrogen, and n is an integer from about one to three, wherein X and Y are selected from the class consisting of lower alkyl groups, cycloalkyl groups, phenyl groups (substituted and unsubstituted), polysiloxanyl groups, fluorine and Z groups; Z is a group of the structure:

and wherein A is selected from the class consisting of lower alkyl groups and phenyl groups, from about 3% to about 10% by weight of a wetting agent, and the remainder being a monomer selected from the class consisting of methyl methacrylate, cyclohexyl methacrylate, and mixtures thereof.

4,216,304

MIXTURE CONTAINING A POLYGLYCIDYL ETHER AND A DIHYDRIC PHENOL AND THE USE THEREOF FOR THE PREPARATION OF PLASTICS

Ferdinand Gutekunst, Rieben; Friedrich Lohse, Oberwil, and Rolf Schmid, Gelterkinden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 11, 1979, Ser. No. 47,952
Claims priority, application Switzerland, Jun. 22, 1978, 6819/78
Int. Cl.² C08G 8/36, 59/14
U.S. Cl. 528—94 **6 Claims**

1. A liquid mixture of a curable epoxide resin, a curing agent for the resin and a curing accelerator, which comprises

(a) as the resin, a glycidyl ether of a phenol novolac, which is liquid at room temperature, is free from ester groups and contains, on average, more than 2 glycidyl groups in the molecule and has an epoxide equivalent weight of 150 to 300 and

(b) as the curing agent, 2,6-dihydroxytoluene, there being 0.5 to 1.1 equivalents of (b) per 1 equivalent of (a).

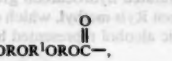
4,216,305

AROMATIC POLYFORMAL CARBONATES AND METHOD FOR MAKING

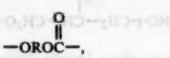
James C. Carnahan, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 18, 1978, Ser. No. 942,952
Int. Cl.² C08G 63/62
U.S. Cl. 528—196 **10 Claims**

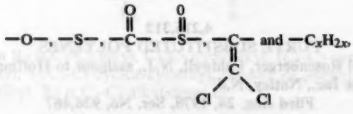
1. Injection moldable poly(formalcarbonates, having a reduced glass transition temperature, consisting essentially of at least 1% by weight of chemically combined units of the formula,



or blocks of such units chemically combined with up to 99% by weight of blocks of polycarbonate units of the formula,



where R is a divalent aromatic hydrocarbon radical selected from the class consisting of phenylene, tolylene, xylylene, naphthalene, halogenated derivatives thereof and $-R^2QR^2-$, where R^2 is selected from $C_{(6-13)}$ divalent aromatic radicals, Q can be cyclohexyl, fluorenyl,



where x is equal to 1 to 5 inclusive, and R^1 is selected from $-CH_2-$ and $-CH_2C_6H_5CH_2-$.

4,216,306

FILM-FORMING POLYMERIZABLE RESIN OF BENZOPHENONE DIANHYDRIDE, EPOXY COMPOUND AND UNSATURATE CARBOXYLIC ACID

Rudolph H. Boeckeler, Grafton, Wis., assignor to Freeman Chemical Corporation, Port Washington, Wis.

Filed Mar. 22, 1979, Ser. No. 22,799
Int. Cl.² C08G 59/42
U.S. Cl. 528—115 **5 Claims**

1. An auto-photoinitiated, polymerizable film-forming composition comprising the reaction product of

(1) 3,3',4,4'-benzophenone tetracarboxylic acid dianhydride;

(2) an organic epoxide resin having a molecular weight less than 1000 and selected from the class consisting of monoepoxide and diepoxide resins;

(3) sufficient ethylenically unsaturated carboxylic acid or anhydride to combine with unreacted expoide radicals, selected from the class consisting of acrylic acid, methacrylic acid, maleic anhydride and maleic acid;

wherein the said ingredient (1) constitutes 2 to 10 percent of the combined weight of ingredients (1), (2) and (3);

said film-forming composition having a viscosity less than 500,000 centipoises, an acid value less than 10 and an epoxy equivalent weight greater than 3500.

4,216,307

POLYHEXAMETHYLENIMINE AND PROCESS FOR ITS PREPARATION

Hitoshi Yuasa, and Hirosuke Imai, both of Yokohama, Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 946,528
Claims priority, application Japan, Sep. 29, 1977, 52-116149; Mar. 16, 1978, 53-29265; Jun. 7, 1978, 53-67617; Jun. 9, 1978, 53-68959
Int. Cl.² C08G 73/02, 73/04
U.S. Cl. 528—422 **3 Claims**

1. A substantially linear polyhexamethylenimine having a molecular weight of at least 1,000 and having a structural unit of the formula $-[(CH_2)_6—NH]-$.

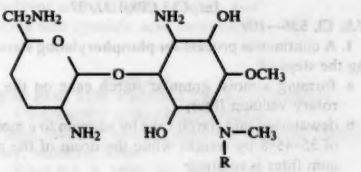
4,216,308

FORTIMICIN FACTORS D AND KE COMPOUNDS

Takao Iida, Tokyo; Kunikatsu Shirahata; Isao Matsubara, both of Machida; Masahiro Sugimoto; Shinzo Ishii, both of Shizuoka; Ryo Okachi, Machida, and Takashi Nara, Tokyo, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 845,970, Oct. 27, 1977, Pat. No. 4,145,253.
This application Dec. 29, 1978, Ser. No. 974,434
Claims priority, application Japan, Oct. 28, 1976, 51-128837; Jan. 14, 1977, 52-2338
Int. Cl.² A61K 31/71; C07H 15/22
U.S. Cl. 536—17 R **3 Claims**

1. A compound of the formula:



wherein R is H or

and the pharmaceutically acceptable non-toxic acid addition salts thereof.

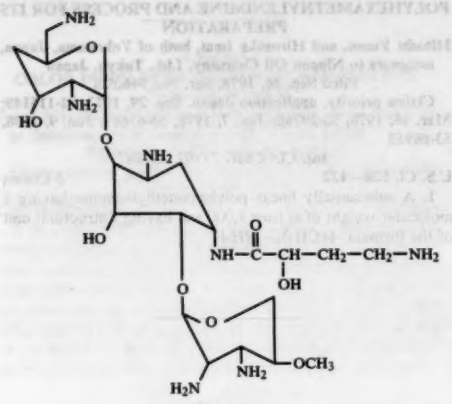
4,216,309

1-N-ACYL-AMINOGLYCOSIDE-XK-88-5

Hideo Matsushima, Machida, and Yasuki Mori, Kawasaki, both of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jan. 13, 1978, Ser. No. 869,264
Claims priority, application Japan, Jan. 13, 1977, 52/1891
Int. Cl.² C07H 15/22
U.S. Cl. 536—17 R **2 Claims**

1. A composition of matter having an antibacterial activity represented by the formula:



and the pharmaceutically acceptable non-toxic acid addition salts thereof.

4,216,310

CONTINUOUS PROCESS FOR PHOSPHORYLATING STARCH

Otto B. Wurzburg, Whitehouse Station; Wadym Jarowenko, Plainfield; Roger W. Rubens, Somerville, all of N.J., and Jayant K. Patel, Calcutta, India, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Apr. 19, 1979, Ser. No. 31,507
Int. Cl.[2] C08B *31/02*
U.S. Cl. 536—109 **10 Claims**

1. A continuous process for phosphorylating starch comprising the steps of:

a. forming a moist granular starch cake on the drum of a rotary vacuum filter;

b. dewatering said starch cake by vacuum to a moisture level of 35–45% by weight while the drum of the rotary vacuum filter is rotating;

c. spraying onto said starch cake an aqueous solution of an alkali metal phosphate salt selected from the group consisting of tripolyphosphate salt, orthophosphate salt, pyrophosphate salt and mixtures thereof in an amount which impregnates said starch cake with at least about 0.5% by weight of total phosphate salt, based on starch solids;

d. dewatering said sprayed starch cake;

e. discharaging said starch cake from the rotary vacuum filter, each of steps a–e being conducted cyclically and continuously as the drum rotates;

f. drying said starch cake; and

g. heat-reacting said dried starch to obtain an orthophosphate starch monoester.

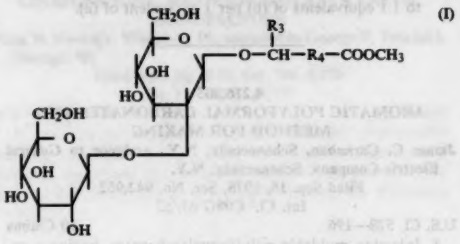
4,216,311

PROCESS FOR PRODUCING A GLYCOLIPID METHYL ESTER

Shigeo Inoue, Saitama; Yoshiharu Kimura, Ichikawa, and Manzo Kinta, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

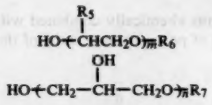
Filed Nov. 17, 1978, Ser. No. 961,555
Claims priority, application Japan, Feb. 17, 1978, 53-17401
Int. Cl.[2] C07H *15/06, 3/04*
U.S. Cl. 536—115 **7 Claims**

1. A process for producing a glycolipid methyl ester represented by the formula (I),

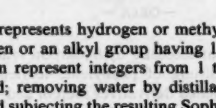


(I)

wherein R_3 represents hydrogen or methyl, and, R_4 represents a staurated or unsaturated hydrocarbon group having 12 to 16 carbon atoms when R_3 is hydrogen, and R_4 represents a saturated or unsaturated hydrocarbon group having 11 to 15 carbon atoms when R_3 is methyl, which comprises mixing at least one polyhydric alcohol represented by formula (III) or (IV),



(III)



(IV)

wherein R_5 represents hydrogen or methyl, R_6 and R_7 represent hydrogen or an alkyl group having 1 to 5 carbon atoms, and m and n represent integers from 1 to 6, with hydrated Sophorolipid; removing water by distillation under reduced pressure; and subjecting the resulting Sophorolipid-polyhydric alcohol system to methanolysis and methylation reactions by reaction with methanol in the presence of a strong acid.

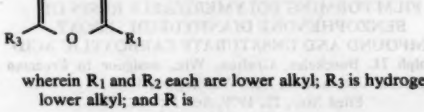
4,216,312

FURYL SUBSTITUTED POLYENES

Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

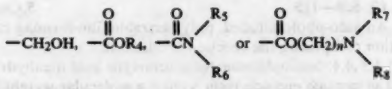
Filed Aug. 24, 1978, Ser. No. 936,467
Int. Cl.[2] C07D *307/40, 307/46, 407/12*
U.S. Cl. 542—427 **24 Claims**

1. A compound of the formula:



I

wherein R_1 and R_2 each are lower alkyl; R_3 is hydrogen or lower alkyl; and R is



wherein R_4 is hydrogen or lower alkyl; R_5, R_6 R_7 and R_8 individually are hydrogen or lower alkyl; R_7 and R_8 can be taken together with the attached nitrogen atom to form a 5 or 6 membered heterocyclic ring which can contain one additional hetero atom selected from the group consisting of nitrogen, oxygen and sulfur, and which hetero atom can be unsubstituted or substituted with lower alkyl; and n is 2 or 3; with the proviso that when R_7 and R_8 are taken together to form a 5 or 6 membered heterocyclic ring which contains an additional nitrogen atom, said additional nitrogen atom is lower alkyl substituted;

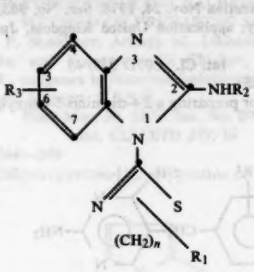
or the pharmaceutically acceptable salts thereof.

4,216,313
ANTIVIRAL THIAZINYL BENZIMIDAZOLES

Charles J. Paget; James W. Chamberlin, both of Indianapolis, and James W. Wikel, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 769,358, Feb. 16, 1977, Pat. No. 4,150,028, which is a continuation-in-part of Ser. No. 626,014, Oct. 28, 1975, abandoned. This application Jan. 12, 1979, Ser. No. 2,836
Int. Cl.² C07D *279/06*
U.S. Cl. 544—55 5 Claims

1. A compound of the formula



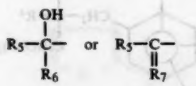
I

wherein

R_1 is hydrogen, C_1-C_3 alkyl, phenyl, or benzyl;

R_2 is hydrogen, or C_1-C_4 alkanoyl;

R_3 is at the 5 or 6 position and is 1-(C_1-C_3 alkyl)-tetrazol-5-yl, 1,3-dithiolan-2-yl,



wherein R_5 is C_1-C_3 alkyl, C_3-C_7 cycloalkyl, (C_3-C_7 cycloalkyl)methyl, 1-(C_3-C_7 cycloalkyl)ethyl, thienyl, or phenyl; R_6 is C_1-C_7 alkyl; R_7 is C_1-C_7 alkylidene; or

wherein R_4 is hydrogen, C_1-C_7 alkyl, C_3-C_7 cycloalkyl, (C_3-C_7 cycloalkyl)methyl, 1-(C_3-C_7 cycloalkyl)ethyl, thienyl, benzyl, phenyl or mono substituted phenyl wherein said substituents are selected from the group consisting of C_1-C_4 alkyl, C_1-C_4 alkoxy, chloro, bromo, iodo, nitro or trifluoromethyl and Z is hydroxyimino, C_1-C_4 alkoxyimino, C_1-C_4 alkanoyloxyimino, hydrazono, α-methoxycarbonylhydrazono, α-hydroxycarbonylmethoxyhydrazono, ethoxycarbonylhydrazono, carbamylhydrazono or thiocarbamylhydrazono; and n is 3.

4,216,314
N-ARYLOXYPROPYL-N'-DIOXOPYRIMIDYL-α,ω-ALKYLENEDIAMINES

Thomas Raabe, Rodenbach; Otto Gräwinger, Frankfurt am Main; Josef Scholtholt, Hanau, and Eckhard Schraven, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,000
Claims priority, application Luxembourg, May 16, 1977, 77339
Int. Cl.² C07D *413/12, 239/54*
U.S. Cl. 544—123 34 Claims

1. Physiologically-active and pharmacologically-acceptable N-[3-(optionally-substituted phenoxy)-2-hydroxypropyl]-N'-[(unsubstituted or 1,3-di(lower)alkyl)-2,4-dioxopyrimid-6-yl]-α,ω-(ethylene or n-propylene)diamine wherein the optionally-substituted phenoxy is unsubstituted phenoxy or phenoxy substituted with at most two ring substituents which are independently selected from the group consisting of hydroxyl; halo; nitro; trifluoromethyl; hydrocarbyl having up to 8 carbon atoms; hydroocarbyloxy having up to 8 carbon atoms; alkanoyl having from 1 to 6 carbon atoms; alkoxyalkoxy having up to 8 carbon atoms; alkoxyalkyl having from 2 to 6 carbon atoms; hydroxyalkoxy having from 2 to 6 carbon atoms; hydrocarbylcarbonylamino having up to 12 carbon atoms; ureido; ureido monosubstituted in the 3-position by a substituent selected from the group consisting of alkyl with from 1 to 6 carbon atoms, alkenyl with from 3 to 6 carbon atoms and cycloalkyl with 5 or 6 ring carbon atoms; 3,3-disubstituted ureido, each substituent of which is, independently, lower alkyl or lower alkenyl; morpholino—CO—NH—; piperidino—CO—NH; and 1-pyrrolidinyl—CO—NH—.

4,216,315
PROCESS FOR PURIFICATION AND RECOVERY OF CYANURIC ACID

Harvie H. Lewis, Mechanicsville, Va.; Neal E. Morganson, Pittsburgh, Pa., and Raymond J. Smialek, Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed May 4, 1979, Ser. No. 35,881
Int. Cl.² C07D *251/32*
U.S. Cl. 544—192 23 Claims

1. A process for the purification and recovery of cyanuric acid from a hot slurry of said cyanuric acid in an organic solvent which comprises:

(a) quenching said hot slurry in a quench liquid to form a first cooled slurry of cyanuric acid particles in a mixture of said solvent and said quench liquid, said quench liquid being at a temperature suitable for cooling said hot slurry,

(b) separating said cyanuric acid particles from said mixture of said solvent and said quench liquid, and

(c) recovering said cyanuric acid particles.

4,216,316
PROCESS FOR THE PRODUCTION OF ALKYL CYANATES AND OLIGOMERS

Edward E. Flagg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1979, Ser. No. 10,298
Int. Cl.² C07C *118/00, 122/00;* C07D *251/34*
U.S. Cl. 544—193 17 Claims

1. A process for the production of organic cyanate compounds comprising reacting a cyanogen halide compound with the thallium(I) salt of a second compound of the formula

wherein R is a radical having 20 carbons or less selected from a group consisting of aryl, alkyl, halogenated alkyl, alkoxy, polyalkoxy, hydroxy substituted alkyl, hydroxy substituted alkoxy, and hydroxy substituted polyalkoxy; and R' is a radical having 20 carbons or less selected from a group consisting of hydrogen, aryl, alkyl, halogenated alkyl, alkoxy, polyalkoxy, hydroxy substituted alkyl, hydroxy substituted alkoxy and hydroxy substituted polyhydroxy at a temperature less than the temperature at which the organic cyanate compound isomerizes to the corresponding isocyanate compound, and recovering the organic cyanate compound formed.

10. A process for the production of oligomers of organic isocyanate compounds comprising reacting a cyanogen halide compound with the thallium(I) salt of a second compound of the formula

wherein R is a radical having 20 carbons or less selected from a group consisting of aryl, alkyl, halogenated alkyl, alkoxy, polyalkoxy, hydroxy substituted alkyl, hydroxy substituted alkoxy, and hydroxy substituted polyalkoxy; and R' is a radical having 20 carbons or less selected from a group consisting of hydrogen, aryl, alkyl, halogenated alkyl, alkoxy, polyalkoxy, hydroxy substituted alkyl, hydroxy substituted alkoxy, and hydroxy substituted polyhydroxy at a temperature less than the temperature at which the organic cyanate compound isomerizes to the corresponding isocyanate compound, recovering the organic cyanate compound formed and retaining said compound at an elevated temperature at which the organic cyanate compound formed isomerizes to the corresponding isocyanate compound and oligomerizes to form an isocyanurate compound.

4,216,317

PROCESS FOR PREPARING ADENINE

Richard F. Shuman, Westfield, and Roger J. Tull, Metuchen, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 903,449, May 8, 1978, abandoned. This application Feb. 12, 1979, Ser. No. 11,269

Int. Cl.[2] C07D *473/34*

U.S. Cl. 544—277 **5 Claims**

1. A process for the preparation of adenine consisting of: heating in a sealed vessel the reactants, HCN, HCl, in Cl_2PO_2H and $POCl_3$ wherein the sealed vessel is heated to about 120° C. to 150° C. for about 15 hours with a maximum internal pressure of about 87 psig and a final temperature of about 25° C. and internal pressure of about 32 psig and the molar ratio HCl:HCN is 1:1; the molar ratio $POCl_3$:Cl_2PO_2H is 1:2–4.5:1; and the molar ratio HCN:Cl_2PO_2H is 1:1.

4,216,318

HETEROCYCLIC ALKYL 4-PYRIMIDONES

Thomas H. Brown; Graham J. Durant, and Charon R. Ganellin, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

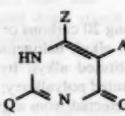
Division of Ser. No. 861,144, Dec. 16, 1977, Pat. No. 4,154,834, which is a continuation-in-part of Ser. No. 753,246, Dec. 22, 1976, abandoned. This application Feb. 16, 1979, Ser. No. 12,640

Claims priority, application United Kingdom, Dec. 29, 1975, 53001/75; Jun. 22, 1977, 26179/77; Jun. 22, 1977, 26180/77; Jun. 23, 1977, 26372/77; Jun. 23, 1977, 26373/77

Int. Cl.[2] C07D *401/06*

U.S. Cl. 544—310 **5 Claims**

1. A compound of the formula:



wherein Q is lower alkylthio, benzylthio, chloro or bromo; Z is hydrogen or lower alkyl; A is a straight or branched alkylene chain containing from 1-5 carbon atoms or $-(CH_2)_pW(CH_2)_q-$ where W is oxygen or sulphur and p and q are such that their sum is from 1 to 4; and Het' is a 5 or 6 membered heterocyclic ring selected from pyridine, pyridine-N-oxide, furan, thiophen, thiazole, oxazole, isothiazole, imidazole, pyrimidine, pyrazine, pyridazine or thiadiazole, which ring is optionally substituted by or or two (which may be the same or different) of the groups selected from lower alkyl, lower alkoxy, halo, hydroxy and amino, or Het' is a pyridine ring with a carbocyclic or cyclic ether ring containing two oxygen atoms fused to it, or Het' is a pyridine, imidazole or thiazole ring which has a benzene ring fused to it.

4,216,319

SYNTHESIS OF 2,4-DIAMINO-5-BENZYLPYRIMIDINES USING BENZYL CYANOACETAL INTERMEDIATES

David A. Yeowell, Chapel Hill, and Roy A. Swaringen, Jr., Durham, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

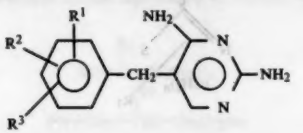
Division of Ser. No. 804,537, Jun. 8, 1977, Pat. No. 4,144,263. This application Nov. 24, 1978, Ser. No. 963,399

Claims priority, application United Kingdom, Jun. 9, 1977, 23756/76

Int. Cl.[2] C07D *239/48*

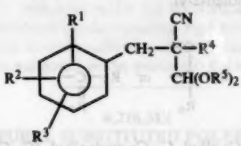
U.S. Cl. 544—325 **19 Claims**

1. A method for preparing a 2,4-diamino-5-benzylpyrimidine of formula (XI),



(XI)

which comprises reacting a benzyl cyanoacetal of formula (I),



(I)

with guanidine in a solvent compatible with and capable of dissolving both reactants, wherein R^1, R^2, and R^3 are the same or different and each is a halogen or hydrogen atom, an alkoxy group, an alkyl group or a dialkylamino group; R^4 is an alkoxy carbonyl group or an aldehyde group; and R^5 is an alkyl group; the alkyl or alkoxy groups each having from 1 to 4 carbon atoms.

4,216,320

QUINOXALINE BLEACH CATALYSTS

Gerald Jan; Remon Hagen, and John Lenoir, all of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

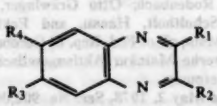
Division of Ser. No. 799,033, May 20, 1977, Pat. No. 4,145,217. This application Oct. 12, 1978, Ser. No. 950,771

Claims priority, application Switzerland, May 24, 1976, 6520/76

Int. Cl.[2] C07D *241/42, 491/14*

U.S. Cl. 544—345 **4 Claims**

1. A quinoxaline of the formula



in which R_1 is hydrogen if R_3 and R_4 conjointly are $-O(CH_2)_pO-$, or is $-CH_2OR$, $-CH_2NRR'$, $-CH_2OCOR$, $-CH_2Cl$, $-CH_2Br$, $-CH_2CN$, $-CH_2SR$, $-CH_2SCN$, $-CH_2O(CH_2)_mOR$, $-CH_2(OCH_2CH_2)_nOR$, $-CH_2SO_2R_5$, $-CH_2PO(OR_5)_2$, $-CH_2SO_3R_6$ or $-CH_2PO(OR_6)_2$ and R_2 is

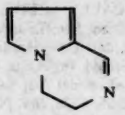
methyl $—CH_2PO(OR_5)_2$, $—CH_2PO(OR_6)_2$ or $CH_2SO_3R_6$, R_3 and R_4 independently are alkyl with 1 to 5 carbon atoms, alkoxy with 1 to 4 carbon atoms, $RO(CH_2)_mO—$ or $RO(CH_2CH_2O)_n—$ or R_3 and R_4 conjointly are $—O(CH_2)_pO—$, R and R′ independently are hydrogen or alkyl with 1 to 4 carbon atoms, R_5 is alkyl with 1 to 4 carbon atoms, R_6 is hydrogen, an alkali metal cation or $—N^{\oplus}(R)_4$, m is 3 or 4, n is 1 to 3 and p is 1 or 2.

4,216,321
3,4-DIHYDROPYRROLO-[1,2-A]-PYRAZINE AND METHOD OF PREPARING SAME

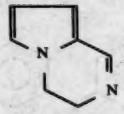
Alexandr P. Skoldinov; Arkady M. Likhosherstov; Vitaly P. Peresada, and Konstantin O. Chizhov, all of Moscow, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Farmakologii, Moscow, U.S.S.R.

Filed Mar. 30, 1978, Ser. No. 891,760
Int. Cl.² C07D *279/30*
U.S. Cl. 544—349 **4 Claims**

1. 3,4-Dihydropyrrolo-[1,2-a]-pyrazine of the formula:



2. A method of preparing 3,4-dihydropyrrolo-[1,2-a]-pyrazine of the formula:



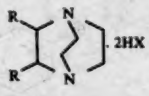
comprising reacting a compound selected from dialkylacetal and dioxalane of 2,5-dialkoxytetrahydrofurfurol with ethylenediamine in a medium of lower aliphatic acids at a temperature within the range of from 100° to 150° C. and then isolating the desired product.

4,216,322
PROCESS FOR MAKING TRIETHYLENE DIAMINES

George H. Temme, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 30, 1978, Ser. No. 956,109
Int. Cl.² C07D *478/08*
U.S. Cl. 544—352 **17 Claims**

1. A process for the preparation of a 1,4-diazabicyclooctane dihydrohalide having the formula

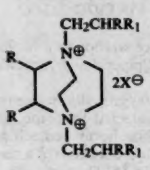


I

wherein each R is independently selected from the group consisting of hydrogen, lower-alkyl, aryl, aralkyl, and cycloalkyl, and X is selected from the group consisting of chlorine and bromine, said process comprising heating in a dipolar aprotic solvent at a temperature of at least about 100° C. a member selected from the class consisting of a dihalo alkylene diamine having the formula:

II

and a 1,4-diazabicyclooctane diammonium dihalide having the formula:



III

wherein, in each instance, R and X are as defined above and R_1 is an electron withdrawing group.

11. A process comprising the steps:

(a) heating N,N′-bis(β-chloroethyl)-N,N′-bis(β-cyanoethyl-)ethylene diamine at a temperature of from about 70° C. to about 95° C. in dimethylformamide and in the presence of ammonia to obtain N,N′-bis(β-cyanoethyl)-1,4-diazabicyclo[2.2.2]octane diammonium dichloride; and

(b) heating the reaction solution from (a) at a temperature of from about 100° C. to about 225° C. to form 1,4-diazabicyclo[2.2.2]octane dihydrochloride.

4,216,323
SEPARATION AND RECOVERY OF 1,4-DIAZABICYCLO-(2,2,2)-OCTANE

Susumi Otsuki; Shizuo Yamada, both of Shin-nanyo, and Yaichro Ono, Kudamatsu, all of Japan, assignors to Toyo Soda Manufacturing Company, Limited, Yamaguchi, Japan

Filed Nov. 7, 1978, Ser. No. 958,398
Claims priority, application Japan, Nov. 22, 1977, 139414
Int. Cl.² C07D *487/18*
U.S. Cl. 544—352 **6 Claims**

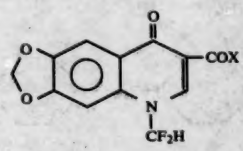
1. A method of separating and recovering 1,4-diazabicyclo-(2,2,2)-octane which comprises adding water to a crude 1,4-diazabicyclo-(2,2,2)-octane including an alkyl pyrazine and then, separating 1,4-diazabicyclo-(2,2,2)-octane by a distillation of water and the alkyl pyrazine and a crystallization.

4,216,324
1-DIFLUOROMETHYL-6,7-METHYLENEDIOXY-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACID

Kyu T. Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 758,331, Jan. 14, 1977, Pat. No. 4,147,788, which is a continuation-in-part of Ser. No. 660,852, Feb. 23, 1976, abandoned. This application Dec. 26, 1978, Ser. No. 972,959
Int. Cl.² C07D *215/56*, *405/10*
U.S. Cl. 546—90 **1 Claim**

1. A compound of the formula:



where

X=—OCH_3, —CC_2H_5, —OC_3H_7 or —Cl.

4,216,325
4-(P-FLUOROBENZOYL)-1-[3-(P-FLUOROBENZOYL)-PROPYL]PIPERIDINE

Laszlo Baum, La Tour-de-Peilz, and Philippe Pochon, Collonges, both of Switzerland, assignors to A. H. Robins Company, Inc., Richmond, Va.

Division of Ser. No. 850,319, Nov. 10, 1977, Pat. No. 4,159,381, which is a continuation of Ser. No. 736,966, Oct. 29, 1976, abandoned. This application Jul. 11, 1978, Ser. No. 966,824
Int. Cl.² C07D *211/32*
U.S. Cl. 546—225 **1 Claim**

1. A process for the preparation of 4-(p-fluorobenzoyl)-1-[3-(p-fluorobenzoyl)propyl]piperidine hydrochloride which comprises:

(a) reacting N-γ-carboxypropylisonipecotic acid with with a chlorinating agent selected from the group consisting of thionyl chloride, phosphorus pentachloride or phosphorus oxychloride in fluorobenzene at a temperature of from about 50° C. to about 85° C., and

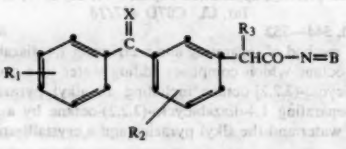
(b) reacting the di-acid chloride hydrochloride prepared in step (a) with at least two equivalents of fluorobenzene at a temperature of from about 15° l C. to about 30° C. in the presence of a Lewis acid and finally at a temperature of from about 80° to about 85° C.

4,216,326
INTERMEDIATES FOR PREPARING ANTI-INFLAMMATORY PHENYL-LOWER-ALKYLAMINES

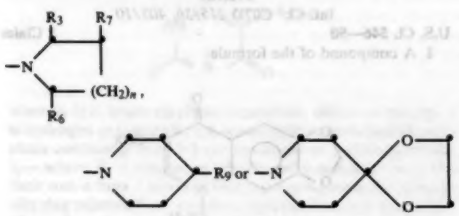
Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 813,167, Jul. 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 641,511, Dec. 17, 1975, Pat. No. 4,069,256, which is a continuation-in-part of Ser. No. 542,553, Jan. 20, 1975, abandoned. This application May 3, 1978, Ser. No. 902,569
Int. Cl.² C07D *211/06*
U.S. Cl. 546—226 **7 Claims**

1. A compound having the formula:



where R_1 represents hydrogen or from one to two, the same or different, lower-alkyl, hydroxy, lower-alkoxy, trifluoromethyl, lower-alkylmercapto, lower-alkylsulfinyl, lower-alkylsulfonyl or halogen selected from fluorine, chlorine and bromine; R_2 represents hydrogen, or lower-alkoxy or hydroxy in the 4-position, or lower-alkyl in either of the 2-, 3-, 4-, 5- or 6-positions; R_3 represents hydrogen or lower-alkyl; the group >C═X represents >C═O or >CH_2; and N═B represents one of the groups



where R_6 and R_7 each represent hydrogen, lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; R_9 represents lower-alkyl, cyclohexyl, cyclohexylmethyl, 2-cyclohexylethyl, 3-cyclohexylpropyl or benzyl; and n represents one of the integers 1, 2 and 3.

4,216,327
2-(2-ACETYLHYDRAZINO)-4-NITROPYRIDINE 1-OXIDE

George C. Wright, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 9, 1979, Ser. No. 56,023
Int. Cl.² C07D *213/89*
U.S. Cl. 546—306 **1 Claim**

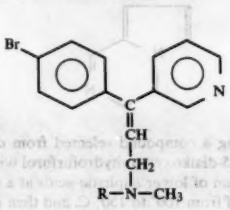
1. The compound 2-(2-acetylhydrazino)-4-nitropyridine 1-oxide.

4,216,328
NOVEL INTERMEDIATE FOR PREPARATION OF THERAPEUTICALLY ACTIVE COMPOUNDS

Peter Bamberg, Oetwil am See; Ladislas J. S. Vegh, Thalwil, both of Switzerland, and Emil Hardegger, deceased, late of Gockhausen, Switzerland (by Olga Hardegger, sole heir), assignors to Astra Lakemedel AB, Sodertalje, Sweden

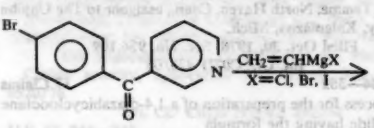
Filed Jun. 26, 1978, Ser. No. 918,724
Claims priority, application Sweden, Jul. 4, 1977, 7707708
Int. Cl.² C07D *213/38*
U.S. Cl. 546—329 **4 Claims**

1. An improved process for preparation of a therapeutically active compound of the formula

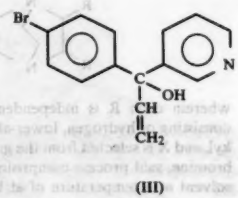


VII

wherein R is methyl or hydrogen, or geometrical isomer thereof or a therapeutically acceptable salt of said compound or geometrical isomer in any degree of hydration, staring with the reaction:

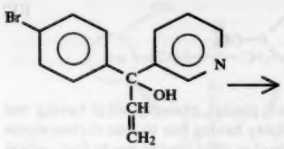


(IV)

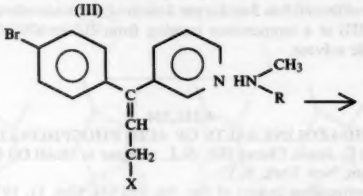


(III)

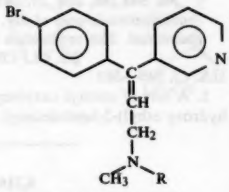
the improvement comprising



(III)



(V)



(VII)

wherein X is a leaving group and wherein R is as defined above.

4,216,329

METHOD OF PRODUCING γ-AMINO ALCOHOLS

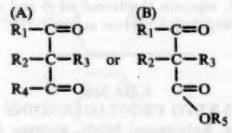
Henry V. Secor, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 26, 1975, Ser. No. 590,669

Int. Cl.² C07D *213/38;* C07C *85/08*

U.S. Cl. 546—334 **5 Claims**

1. A process for the production of γ-amino alcohols comprising reacting a β-dicarbonyl compound having one of the formulae:



wherein:

R_1 is hydrogen, alkyl, aryl or alkylaryl; each of R_2 and R_3 is hydrogen, alkyl, aryl, alkylaryl, heteroaromatic, or alkylheteroaromatic;

R_4 is hydrogen, alkyl, aryl, or alkylaryl; and R_5 is alkyl; with alkoxyamine selected from the group consisting of methoxyamine, ethoxyamine or benzyloxyamine to produce the monoalkoximino intermediate and reducing said intermediate to yield γ-amino alcohol.

4,216,330

5-[4-MONOALKYLAMINOPHENYL]TETRAZOLES

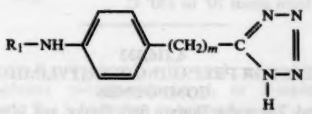
Robert G. Shepherd, South Nyack, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 836,946, Sep. 27, 1977, Pat. No. 4,117,158. This application Jul. 24, 1978, Ser. No. 927,184

Int. Cl.² C07D *257/06;* A61K *31/41*

U.S. Cl. 548—254 **8 Claims**

1. A compound selected from the group consisting of those of the structural formula:



wherein R_1 is a straight chain or branched alkyl group of the formula C_nH_{2n+1} wherein n is an integer from 8 to 19, inclusive; m is 0, 1 or 2; and the pharmacologically acceptable cationic and acid-addition salts thereof.

4,216,331

USE OF CHIRAL RHODIUM-DIPHOSPHINE CATALYST CAPABLE OF CATALYTIC REDUCTION OF A TETRAMISOLE PRECURSOR TO GIVE A SIGNIFICANT EXCESS OF THE DESIRED S-(−) ISOMER LEVAMISOLE

William A. Henderson, Jr., Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 896,254, Apr. 14, 1978, Pat. No. 4,166,824, which is a continuation-in-part of Ser. No. 806,423, Jun. 14, 1977, abandoned. This application Feb. 6, 1979, Ser. No. 9,884

Int. Cl.² C07D *233/38*

U.S. Cl. 548—320 **1 Claim**

1. In a method for the preparation of optically active 3-acyl derivatives of 1-(2-alkoxyethyl)-4-phenyl-2-imidazolidones from 3-acyl derivatives of 1-(2-alkoxyethyl)-4-phenylimidazolin-2-one by hydrogenating in the presence of a solvent, the improvement comprising:

hydrogenating in the presence of a chiral catalyst prepared by reacting a chiral enantiomer of the compound trans-2,3-Bis(diphenylphosphinomethyl)bicyclo[2.2.1]heptane with $[Rh(COD)X]_2$, wherein X is Cl, Br or I.

4,216,332

PREPARATION OF CHLORINATED N-METHYL-IMIDAZOLES AND N-METHYL-IMIDAZOLINES

Manfred Lenthe, Odenthal-Neschen, and Gerhard Dankert, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

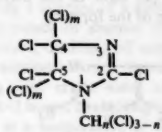
Filed Dec. 29, 1978, Ser. No. 974,411

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803037

Int. Cl.² C07D *233/28, 233/68*

U.S. Cl. 548—337 **4 Claims**

1. In the preparation of chlorinated N-methyl-imidazoles and N-methyl-imidazolines of the formula



in which

n represents the number 0, 1, 2 or 3 and

m represents the number 0 or 1, a double bond being present between the C atoms in the 4-position and 5-position when m is 0, and a single bond being present when m is 1, by chlorinating N,N-dimethylaminoacetonitrile of the formula

$$(CH_3)_2N—CH_2—CN$$

or its hydrochloride, the improvement which comprises introducing N,N-dimethyl-aminoacetonitrile or its hydrochloride into a mixture of its chlorination products, with simultaneous addition of chlorine gas, in the absence of a solvent, at a temperature from about 70° to 150° C.

4,216,333

PROCESS FOR PREPARING N-TRITYLIMIDAZOLE COMPOUNDS

Hideo Agui, Toyonaka; Ikutaro Saji, Osaka, and Mitsuo Nakashita, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

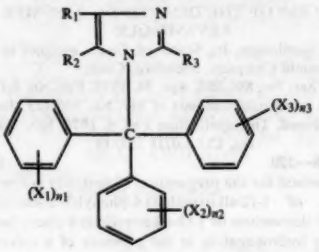
Filed Jan. 30, 1979, Ser. No. 7,843

Claims priority, application Japan, Oct. 30, 1978, 53-134178; Oct. 31, 1978, 53-134964

Int. Cl.² C07D *233/62*

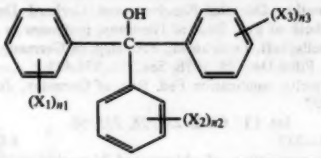
U.S. Cl. 548—345 **2 Claims**

1. A process for preparing N-tritylimidazole of the formula:



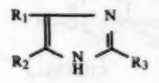
[I]

wherein R_1, R_2 and R_3 are independently hydrogen, alkyl having one to twelve carbon atoms or phenyl, X_1, X_2 and X_3 are independently alkyl having one to twelve carbon atoms, halogen, nitro, trifluoromethyl, cyano, alkylthio having one to four carbon atoms or alkoxy having one to four carbon atoms and n_1, n_2 and n_3 are each zero or an integer of 1 to 2, which process comprises reacting a tritylcarbinol derivative of the formula:



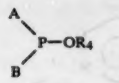
[II]

wherein X_1, X_2, X_3, n_1, n_2 and n_3 are each as defined above, with 1 to 3 moles, per mole of the tritylcarbinol (II), of an imidazole derivative of the formula:



[III]

wherein R_1, R_2 and R_3 are each as defined above, in the presence of a phosphorus compound of the formula:



[IV]

wherein A and B are each phenyl, phenoxy, alkyl having one to four carbon atoms, alkoxy having one to four carbon atoms or hydroxy and R_4 is phenyl or alkyl having one to four carbon atoms, the amount of said phosphorus compound being in a range of from 0.5 to 3 moles per 1 mole of the imidazole derivative (III) at a temperature ranging from 10° to 130° C. in a suitable solvent.

4,216,334

IMIDAZOLINE SALTS OF ACID PHOSPHONATES

Daniel G. Jones, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 840,924, Oct. 11, 1977, abandoned, which is a division of Ser. No. 733,581, Oct. 18, 1976, Pat. No. 4,070,294, which is a continuation-in-part of Ser. No. 544,245, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 386,481, Aug. 7, 1973, abandoned. This application Feb. 1, 1979, Ser. No. 8,456

Int. Cl.² C07D *233/14*

U.S. Cl. 548—352 **2 Claims**

1. A salt of methyl octadecyl acid phosphonate and 1-(2-hydroxy ethyl)-2-heptadecenyl imidazoline.

4,216,335

AZO METHINE CONTAINING COMPOUNDS

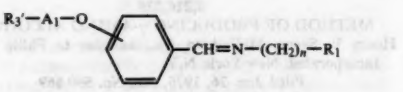
John Krapcho, Somerset, and Chester F. Turk, Kendall Park, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 897,476, Apr. 18, 1978, Pat. No. 4,166,072, which is a division of Ser. No. 773,561, Mar. 2, 1977, Pat. No. 4,098,789. This application Apr. 25, 1979, Ser. No. 33,299

Int. Cl.² C07C *101/24, 103/22*

U.S. Cl. 560—35 **3 Claims**

1. A compound having the formula



wherein

R_1 is alkoxycarbonyl, amido, alkylamido or dialkylamido;

R'_3 is alkylbenzylamino, dialkylamino, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, or 4-alkyl-1-piperazinyl;

A_1 is an alkylene group having 2 to 5 carbon atoms; and

n is 1, 2 or 3; wherein the terms alkyl and alkoxy refer to groups having 1 to 6 carbon atoms.

4,216,336

5-KETO PROSTAGLANDINS

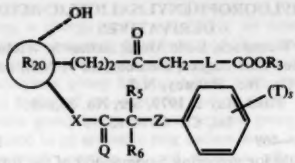
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 932,898, Aug. 11, 1978, which is a division of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Jun. 22, 1979, Ser. No. 51,223

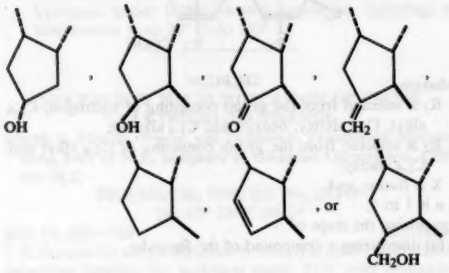
Int. Cl.² C07C *177/00*

U.S. Cl. 560—53 **117 Claims**

1. A compound of the formula



or a mixture comprising that compound and the enantiomer thereof wherein R_{20} is



wherein L is

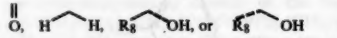
(1) $-(CH_2)_d-C(R_2)_2-$

(2) $-O-CH_2-Y$ or

(3) $-CH=CH-$

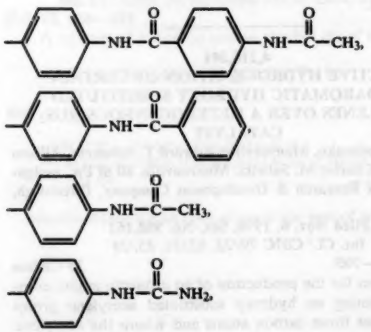
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,

wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,

wherein R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,



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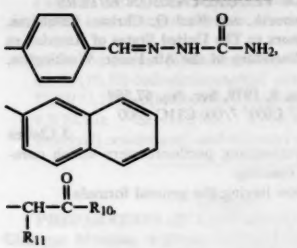


wherein R_{10} is phenyl, p-bromophenyl, p-biphenyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation,

wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);

wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;

wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and

wherein X is

(1) trans—CH=CH—

(2) cis—CH=CH—

(3) —C≡C— or

(4) $-CH_2CH_2-$;

including the lower alkanoates thereof.

4,216,337

PROCESS FOR PREPARING ESTERS

Makoto Baba, Kurashiki; Teruyuki Ninomiya, and Chieko Ono, both of Okayama, all of Japan, assignors to Mitsubishi Gas Chemical Co., Inc., Japan

Continuation-in-part of Ser. No. 756,605, Jan. 4, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,406

Claims priority, application Japan, Jan. 13, 1976, 51-3033; Jan. 30, 1976, 51-8987

Int. Cl.² C07C 67/48

U.S. Cl. 560—78 11 Claims

1. A process for the production of esters which consists essentially of reacting a mixture of a polycarboxylic acid and an alcohol in the presence or absence of a catalyst which is insoluble in the mixture, distilling off unreacted alcohol from the esterification reaction mixture obtained to give a crude ester, heat-treating said crude ester at a temperature of 160°–340° C. for 0.1–3 hours, contacting said heat-treated ester with an adsorbent at a temperature of 30°–150° C. and then separating and recovering the desired ester from the crude ester.

4,216,338
SYNTHESIS OF FLUOROCARBON ESTERS

Carl J. Schack, Chatsworth, and Karl O. Christe, Calabasas, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 8, 1979, Ser. No. 47,558
Int. Cl.[2] C09F 7/00; C11C 3/00
U.S. Cl. 560—227 **3 Claims**

1. A process for synthesizing perfluoroesters which comprises the step of first reacting:

(A.) a perfluorocarbon having the general formula

$$R_fCO_2M$$

wherein R_f is a saturated, straight, or branched chain perfluoroalkyl radical having one to ten carbon atoms and M is a member selected from the group consisting of an alkali metal and hydrogen; and

(B.) a halogen fluorosulfate having the general formula

$$XSO_3F$$

wherein X is a member selected from the group consisting of chlorine, bromine and iodine; and

(C.) maintaining said reaction at a temperature of from about −78° C. to −20° C. for a period of time sufficient to produce an intermediate acyl hypohalite reaction products having the general formula

(D.) effecting a second reaction between said hypohalite and an appropriate olefinic reactant at a temperature of from about −78° C. to −20° C. for a period of time sufficient to effect a reaction therebetween; and

(E.) separating the resulting perfluoroester reaction product.

4,216,339
PROCESS FOR THE PRODUCTION OF METHYL FORMATE

Willy Couteau, Brussels, and Jean Ramioulle, Bierghes, both of Belgium, assignors to U C B, Societe Anonyme, Brussels, Belgium

Filed Mar. 10, 1977, Ser. No. 776,369
Claims priority, application United Kingdom, Mar. 12, 1976, 10026/76
Int. Cl.[2] C07C 67/36
U.S. Cl. 560—232 **11 Claims**

1. In a process for the production of methyl formate, wherein a current of a gas containing carbon monoxide is reacted at elevated temperature and pressure in a reaction zone with a recycled current of liquid reaction mixture containing

(a) methanol

(b) an alkali metal or alkaline earth metal methoxide as catalyst, and

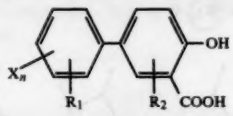
(c) methyl formate produced as reaction product, part of the current of liquid reaction mixture being withdrawn in order to recover the methyl formate therefrom, the improvement which comprises providing in the reaction zone a venturi means which ensures sucking of the current of gas by the recycled current of liquid reaction mixture, and maintaining the temperature in the reaction zone at from about 70 to about 110° C. and the contact surface area between the gas phase and the liquid phase at from 750 to 5,000 sq. meters per cubic meter of liquid phase.

4,216,340
PREPARATION OF 5-(2,4-DIFLUOROPHENYL)SALICYLIC ACID AND DERIVATIVES

Leonard M. Weinstock, Belle Mead; Arthur S. Wildman, Martinsville, and Carl Bagner, Paramus, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 2, 1979, Ser. No. 35,149
Int. Cl.[2] C07C 65/78
U.S. Cl. 562—469 **15 Claims**

1. A method for preparing a compound of the formula:



wherein:

R_1 is selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, benzyl, and C_{1-4} alkenyl;

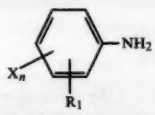
R_2 is selected from the group consisting of C_{1-4} alkyl and C_{1-4} alkoxy;

X is fluoro; and

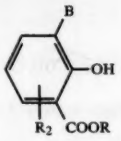
n is 1 to 5;

comprising the steps of

(a) diazotizing a compound of the formula:



(b) treating the diazonium salt of step (a) with a compound of the formula:



wherein:

B is an easily removed blocking group; and

R is C_{1-4} alkyl;

(c) removing the blocking group B from the product of step (b); and

(d) hydrolyzing the ester of step (c) to form the acid final product.

4,216,341
SELECTIVE HYDROGENATION OF CERTAIN NITROAROMATIC HYDROXY SUBSTITUTED ACETYLENES OVER A HETEROGENEOUS RUS_2 CATALYST

Anatoli Onopchenko, Monroeville; Edward T. Sabourin, Allison Park, and Charles M. Selwitz, Monroeville, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 6, 1978, Ser. No. 958,161
Int. Cl.[2] C07C 79/22, 85/11, 85/24
U.S. Cl. 568—705 **25 Claims**

1. A process for the production of an aromatic amino compound containing an hydroxy substituted acetylene group having at least three carbon atoms and where the acetylene

group is directly connected to an aromatic ring carbon atom which comprises:

contacting a charge stock comprising an aromatic nitro compound containing (i) at least one nitro group directly connected to an aromatic ring carbon atom and (ii) at least one acetylene group having at least three carbon atoms and an hydroxyl group on the carbon atoms adjacent to acetylene group, wherein the acetylene group is directly connected to an aromatic ring carbon atom, and wherein the aromatic portion of said aromatic nitro acetylene compound is selected from the group consisting of benzene, naphthalene, bibenzyl, diphenyl, diphenyl oxide, diphenyl sulfide and benzophenone, in the liquid phase with a solid catalyst consisting essentially of a ruthenium disulfide and in the added presence of free molecular hydrogen under hydrogenation conditions including a temperature from 20° C. to 120° C.

4,216,342

PROCESS FOR THE PURIFICATION OF CRUDE 2,4,5-TRICHLOROPHENOL

Joseph A. Virgilio, Wayne, and Joachim E. Freudewald, Morristown, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Mar. 30, 1979, Ser. No. 25,419
Int. Cl.[2] C07C *39/24*
U.S. Cl. 568—755 **11 Claims**

1. Process for the purification of technical grade TCP which comprises treating the technical grade TCP with formaldehyde in the presence of 55% to 75% sulfuric acid at a temperature between 70° C. and 90° C. and separating purified TCP therefrom.

4,216,343

HIGH MOLECULAR WEIGHT POLYHYDRIC ALCOHOLS

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 4, 1979, Ser. No. 26,858
Int. Cl.[2] C07C *31/18*; C08G *18/32*
U.S. Cl. 568—853 **6 Claims**

1. A gem-bis(hydroxymethyl) alcohol of the formula: $CH_3(CH_2)_m[C(CH_2OH)_2]_n(CH_2)_p[C(CH_2OH)_2]_q(CH_2)_r[C(CH_2OH)_2]_s(CH_2)_tCH_2OH$ wherein n plus q plus s are integers the sum of which is from 1 to 3; n, q, and s are 0 or 1 and; m through t are integers the sum of which is 16 which is mono-, di- or tri-[bis(hydroxymethyl)] octadecanol.

4,216,344

HIGH MOLECULAR WEIGHT POLYOL MIXTURES

Edgar R. Rogier, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 4, 1979, Ser. No. 26,859
Int. Cl.[2] C07C *31/18*; C08G *18/32*; C07C *31/20*
U.S. Cl. 568—853 **8 Claims**

1. A mixture of a diol (a) and an alcohol (b) of the formula:

$$H(CH_2)_hCH(CH_2OH)(CH_2)_kCH_2OH \text{ TM (a)}$$

and

$$CH_3(CH_2)_m[C(CH_2OH)_2]_n(CH_2)_p[C(CH_2OH)_2]q(CH_2)_r[C(CH_2OH)_2]_s(CH_2)_tCH_2OH \text{ TM (b)}$$

wherein n plus q plus s are integers the sum of which is from 1 to 3, m through t are integers the sum of which is 16 and h plus k are integers the sum of which is from 12 to 20; and,

wherein component (b) is selected from the group consisting of 9,9(10,10)-bishydroxymethyl octadecanol, 9,9(10,10); 12,12(13,13) di[bis(hydroxymethyl)] octadecanol, and 9,9(10,10); 12,12(13,13); 15,15(16,16) tri*bis(hydroxymethyl)] octadecanol, and mixtures thereof.*

4,216,345

PREPARATION OF LINEAR ALKYLBENZENES

Giuseppe Messina, Alghero; Loreno Lorenzoni, Porto Torres, and Lucio Di Fiore, Milan, all of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Sep. 28, 1978, Ser. No. 946,929
Int. Cl.[2] C07C *15/02, 7/13*
U.S. Cl. 585—323 **12 Claims**

1. In a process for the preparation of alkylbenzenes by partial chlorination of linear paraffins having from 9–15 carbon atoms per molecule, catalytic alkylation of benzene using the resulting mixture of chlorinated and unreacted paraffins, fractionation by distillation, after separation of the catalyst, of the alkylation products thus obtained and recycling of the unreacted paraffins recovered from the fractionation stage to the partial chlorination stage, the improvement which comprises submitting at least a part of the unreacted paraffins to be recycled to the partial chlorination stage, continuously or intermittently, to a purification treatment with molecular sieves selected from the group consisting of X and Y zeolites at a temperature ranging from ambient temperature to 200 degrees C and at a pressure ranging from 1–10 atmospheres to produce alkylbenzenes free from odor, having a chlorine content less than 100 ppm and wherein the treated unreacted paraffins have levels of all other impurities lower than levels detectable by flame gas-chromatography.

4,216,346

HYDROCARBON DEHYDROGENATION METHOD EMPLOYING PLATINUM-COBALT-ZINC CATALYST

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 892,369, Mar. 31, 1978, which is a division of Ser. No. 744,061, Nov. 22, 1976, Pat. No. 4,115,252. This application Mar. 5, 1979, Ser. No. 17,303
The portion of the term of this patent subsequent to Sep. 19, 1995, has been disclaimed.
Int. Cl.[2] C07C *5/40*
U.S. Cl. 585—379 **34 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon, at hydrocarbon dehydrogenation conditions, with a nonacidic catalytic composite consisting essentially of a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, and about 0.01 to about 5 wt. % zinc; wherein the platinum group, catalytically available cobalt and zinc components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrogenation conditions or in a mixture of these states.

4,216,347

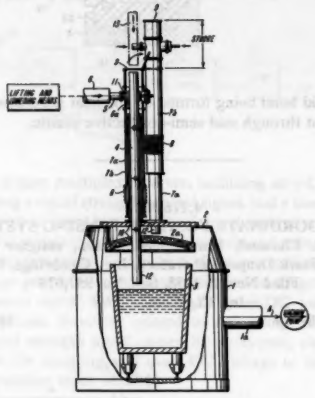
VACUUM-ELECTRIC ARC HEATING SYSTEM

Heinz Holtermann, Meerbusch, and Arno Luven, Krefeld-Bockum, both of Fed. Rep. of Germany, assignors to Standard-Messo-Duisburg Gesellschaft für Chemietechnik mit beschränkter Haftung & Co., Duisburg, Fed. Rep. of Germany

Filed Jan. 16, 1974, Ser. No. 433,906

Int. Cl.[2] H05B *7/00*

U.S. Cl. 13—9 R **8 Claims**



1. An electric arc heating system for use in connection with a vacuum metallurgic unit comprising a vessel and a cover thereon having passage means for the passage of at least one electrode therethrough, which includes: at least one electrode composed of a plurality of interconnected graphite sections, current supply means connected directly to said electrode, lifting and lowering means detachably connected to said electrode for lifting and lowering the same, tubular mantle means surrounding said electrode and adapted to be connected to said cover at said passage means in a vacuum-tight manner, and jacket means surrounding both said electrode and the tubular mantle means therefor in a vacuum-tight manner and being movable upwardly and downwardly together with said electrode and relative to said tubular mantle means, said jacket means including cover means arranged at that end of said jacket means which in mounted position of said heating system will be remote from the vacuum metallurgic unit for which said electric arc heating system is intended, said jacket means being adapted selectively to be opened with vacuum being broken to afford access to the electrode for replacement of graphite sections within said jacket, and said cover means being adapted to be closed again in a vacuum-tight manner.

4,216,348

ROOF ASSEMBLY FOR AN ELECTRIC ARC FURNACE

Joseph I. Greenberger, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Feb. 9, 1979, Ser. No. 11,289

Int. Cl.[2] F27D *1/12, 1/18*

U.S. Cl. 13—32 **12 Claims**

1. A roof assembly for an electric arc furnace having a centrally located roof closure means with electrodes associated therewith, and comprising:

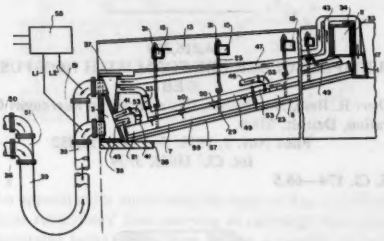
a first ring means having passageway means for receiving cooling medium and defining the outer periphery of said roof assembly;

a second ring means located concentrically and inwardly of said first ring means and defining the outer periphery of said roof closure means and including passageway means for receiving cooling medium to cool said roof closure means;

said second ring means and said roof closure means constructed and arranged to be removed and replaced as a unit to and from said roof assembly,

a plurality of panel units constructed and arranged between said first and second ring means in a manner to be self-supporting and having a series of passageways,

supporting means having a portion for carrying said first ring means and a portion for supporting said second ring means in a manner to permit said removal and replacement of said second ring means and closure means, and including means for additionally supporting said panel units,



coolant medium transfer means for bringing and taking away a coolant medium to and from said passageway means of said first ring means, including means associated with said passageway means of said first ring means for carrying said coolant medium simultaneously to said passageway means of said second ring means and said passageways of said panel units and simultaneously away from said passageway means of said second ring means and said passageways of said panel units.

4,216,349

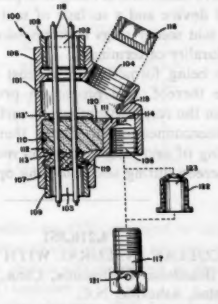
FILL CONTROL FOR SEALING CHAMBER IN DRAINABLE ENCLOSURE FOR EXPLOSION-PROOF ELECTRICAL SYSTEM

Eigil Wium, Cheshire, Conn., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 29, 1979, Ser. No. 53,614

Int. Cl.[2] H02B *3/02*

U.S. Cl. 174—50 **4 Claims**



1. A fitting for use in an explosion-proof electrical system comprising in combination:

(a) a hollow body member having an entrance port, an exit port below and in axial alignment with said entrance port, a filling port and a drainage port;

(b) said body member including a sealing chamber communi-

cating with all of said ports and situated between said entrance and exit ports;

(c) said sealing chamber and said drainage port having an upper limit in a coincident horizontal plane and separated by a wall comprising an interior portion of said body member and having an upper limit coincident with said coincident plane; and wherein:

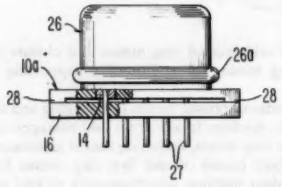
(d) said body member includes an interior shield member extending over said upper limit of said drainage port for preventing vertical communication between any portion of said filling port and said drainage port.

4,216,350

MULTIPLE SOLDER PRE-FORM WITH NON-FUSIBLE WEB

Gilbert R. Reid, Norristown, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 1, 1978, Ser. No. 956,852
Int. Cl.³ H05K *3/34*
U.S. Cl. 174—68.5 **1 Claim**



1. A solder assembly for electronic device packaging comprising in combination:

at least one device having a plurality of terminals emanating therefrom,

an interconnection medium having a plurality of openings for receiving said terminals,

a multiple solder pre-form having a planar web of material which is non-fusible in the heat attendant with the soldering operation and is non-wetted by solder, said web having a plurality of apertures arranged in a predetermined pattern homologous with that of said plurality of terminals, a plurality of solder rings disposed respectively in said apertures, said web being comprised of electrically insulative material and being interposed between the body of said device and a surface of said interconnection medium, said solder rings encompassing respective ones of said plurality of terminals,

said web being formed with at least one projection on a surface thereof, said projection providing a separation between the respective adjacent surfaces of said web and said interconnection medium, thereby permitting the cleansing of said interconnection medium of flux deposited thereon during said soldering operation.

4,216,351

PLASTIC COLLAR INTEGRAL WITH A CABLE JACKET

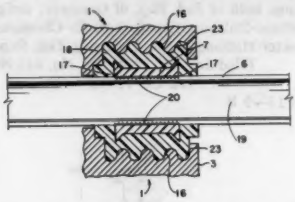
Edward P. Brandeau, Willimantic, Conn., assignor to Akzona Incorporated, Asheville, N.C.

Filed Aug. 26, 1977, Ser. No. 828,063
Int. Cl.² H01B *13/00*
U.S. Cl. 174—92 **10 Claims**

1. An assembly comprising:

a cable having an plastic outer jacket; and

a semi-conductive plastic collar molecularly bonded to said plastic jacket; said semi-conductive plastic having a volume resistivity such that said semi-conductive plastic will melt-bond to the cable jacket upon the application of a predetermined current through said semi-conductive plastic, said bond being formed by the heat generated by the current through said semi-conductive plastic.

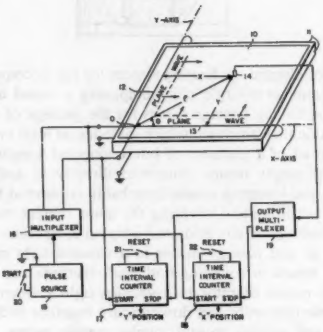


4,216,352

TWO COORDINATE POSITION SENSING SYSTEMS

Jacques R. Chamuel, Framingham, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 2, 1978, Ser. No. 957,079
Int. Cl.² G08C *21/00*
U.S. Cl. 178—19 **19 Claims**



1. A system for determining a position on the surface of a member capable of supporting elastic traveling waves having electromagnetic fields associated therewith, said system comprising

first distributed transducer means for generating a first continuous elastic plane wave signal having an electromagnetic field associated therewith which travels in said member in a first direction;

second distributed transducer means for generating a second continuous elastic plane wave signal having an electromagnetic field associated therewith which travels in said member in a second direction at a selected angle with reference to said first direction;

means for detecting the presence of the electromagnetic fields associated with said first and second continuous plane wave signals as said signals travel past said detecting means, said detecting means being located at a position to be determined;

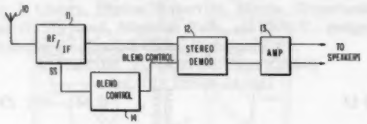
means responsive to the phases of said continuous plane wave signals detected at said detecting means and to the phases of the corresponding signals at said first and second distributed transducer generating means for determining the respective distances from said first and second generating means to said detecting means; and

means for substantially reducing reflections of said traveling continuous elastic plane waves in said member.

4,216,353
ADAPTIVE MULTIPLEX BLEND CONTROL FOR STEREO DECODER TO MAINTAIN SIGNAL TO NOISE RATIO

Lawrence W. Fish, Jr., Chenango, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.

Filed Mar. 27, 1979, Ser. No. 24,911
Int. Cl.² H04H 5/00
U.S. Cl. 179—1 GJ 7 Claims



1. In a stero multiplex receiver, including an r-f, i-f section generating a signal strength control signal, and a stereo demodulator with an input terminal for channel separation control, a device for maintaining signal to noise ratio and reducing distortion in the presence of multi-path effect comprising:

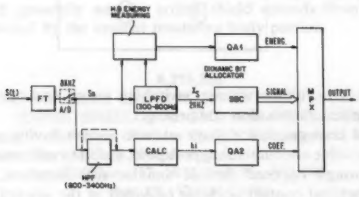
voltage generator means responsive to said signal strength control signal for generating a quasi-DC voltage with amplitude inversely related to AC components in said signal strength signal caused by multi-path, and

means for coupling said quasi-DC voltage to said channel separation input terminal.

4,216,354
PROCESS FOR COMPRESSING DATA RELATIVE TO VOICE SIGNALS AND DEVICE APPLYING SAID PROCESS

Daniel J. Esteban; Claude R. Galand, both of La Gaude; Daniel Mauduit, Nice, and Jean Menez, Cagnes-sur-Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1978, Ser. No. 964,324
Claims priority, application France, Dec. 23, 1977, 77 39912
Int. Cl.² G10L 1/00
U.S. Cl. 179—15.55 R 16 Claims

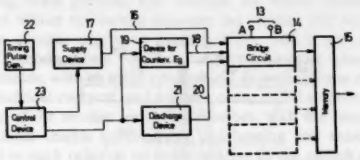


1. Process for compressing a digitally encoded voice signal, said compression resulting from a transcoding operation, characterized in that it includes the following steps: on a recuring basis splitting an epoch of the frequency bandwidth of said voice signal into a low frequency and a high frequency band, digitally coding and requantizing with dynamic bit allocation for each epoch the contents of said low frequency band for each epoch to generate SIGNAL information, processing the contents of said high frequency band for each epoch to generate a set of preemphasised parcor type coefficients (COEF), processing the contents of said high frequency band for each epoch to generate energy information (ENERG), said SIGNAL, COEF and ENERG data generated for each epoch providing the digital data characterizing the compressed voice signal.

4,216,355
TELEPHONE LINE MONITORING APPARATUS

Hansueli Gerber, Bern, Switzerland, assignor to Chr. Gfeller A.G., Bern, Switzerland

Filed Oct. 24, 1978, Ser. No. 954,204
Claims priority, application Switzerland, Nov. 3, 1977, 13397/77
Int. Cl.² H04M 3/22
U.S. Cl. 179—18 AB 5 Claims



1. An apparatus for monitoring the busy or free condition of telephone subscribers' lines carrying an exchange line voltage, said apparatus being of the type having a number of bridge circuits corresponding to the number of said lines, each of said bridge circuits being connected to one of said lines and including means for generating a signal when the associated one of said lines is busy and means for applying to said associated one of said lines a voltage compensating said exchange line voltage, the improvement comprising:

means for periodically generating a countervoltage oppositely directed to said compensating voltage,

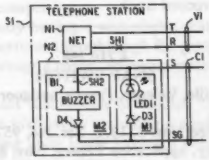
means disposed in each of said bridge circuits for applying said countervoltage thereto, and

means for controlling said countervoltage generating means.

4,216,356
TELEPHONE HAVING SEPARATE VOICE AND SIGNALING PAIRS

Edmund T. Burke, West Long Branch, and David F. Jones, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 21, 1979, Ser. No. 13,567
Int. Cl.² H04Q 5/18
U.S. Cl. 179—99 LS 11 Claims



1. A telephone station set (S1) arranged to communicate voice, control and status signaling over a two pair facility to a connected telephone system characterized in that said telephone station set (S1) includes

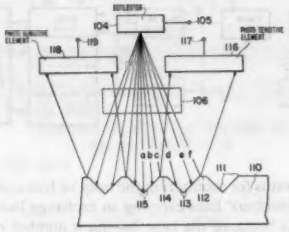
a communication network means (N1) for providing dialing and voice communications to said telephone system over a voice communication pair (V1) of said two pair facility, and

a signaling network means (N2) arranged for providing supervisory analog voltage signaling and for responding to existing analog voltage ringing and visual signaling voltages from said telephone system over a signaling pair (C1) of said two pair facility.

4,216,357
OPTICAL PLAY-BACK SYSTEM FOR RECORDED SIGNALS WITH OSCILLATING BEAM

Norio Iwasaki; Toshio Satoh, both of Tokyo; Hiroyuki Ito, Kawasaki, and Ikuya Koike, Narashino, all of Japan, assignors to Fuji Telecasting Co., Ltd., Tokyo, Japan

Filed Nov. 22, 1976, Ser. No. 743,661
Claims priority, application Japan, Mar. 1, 1976, 51-21198
Int. Cl.[2] G11B *11/00, 7/12*
U.S. Cl. 179—100.1 R 14 Claims



1. A play-back system for reproducing information recorded on a medium, the information being recorded in the form of a continuous record track, with reflective surfaces on both sides of said track, the width of said track having been changed in accordance with the information comprising:

a first light source for reproducing a light beam,

means for oscillating said beam transverse to said track and said reflective surfaces at a predetermined frequency and with an amplitude at least one-half of the average distance between tracks,

means for moving said medium in a manner such that said track is substantially perpendicular to the oscillating direction of said beam,

means for generating a reference signal signifying the center of oscillation of said beam,

first photosensitive means for receiving light of said source reflected from said reflective surfaces of said medium to produce a signal representing the widths of said reflective surfaces,

means for combining said signal representing the widths of said reflective surfaces with said reference signal to produce a modulated signal representing the average center and the edge of said track, and

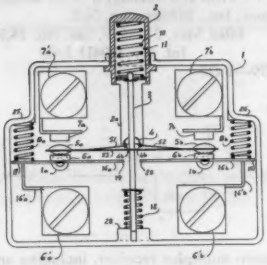
tracking means, electrically connected to said first photosensitive means, for having said first photosensitive means track said record track.

4,216,358
SNAP SWITCH

Jean-Yves Brozille, Valence, France, assignor to Crouzet, Paris, France

Filed Nov. 3, 1978, Ser. No. 957,055
Claims priority, application France, Nov. 8, 1977, 77 33681
Int. Cl.[2] H01H *1/14, 5/26*
U.S. Cl. 200—67 D 2 Claims

1. A snap, switch, comprising a control button, a spring, a control rod slidable with the control button via said spring, first and second pairs of contacts, first and second pairs of terminals associated with said first and second pairs of contacts, respectively, resilient conducting means, a setting spring fixed to said control rod and to said resilient conducting means, the two contacts of each pair of contacts being connectable by said resilient conducting means under the action of said setting spring, the two contacts of the first pair of contacts being able to be electrically disconnected from their respective terminals by said control button when it is pushed in completely against the action of said spring of said control rod, two conducting plates pivotally mounted in the switch, each of said conducting plates bearing one of the two contacts of the first pair of contacts and resilient means for biasing said conducting plates toward said first pair of terminals and thus connecting electrically said first pair of contacts to first pair of terminals,

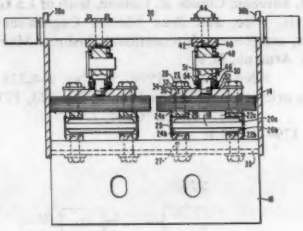


whereby said conducting plates can be pivoted under the action of said control button and against the action of said resilient biasing means for electrically disconnecting said first pair contacts from their respective terminals.

4,216,359
LOW VOLTAGE VACUUM SWITCH AND OPERATING MECHANISM

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 650,406, Jan. 19, 1976, abandoned, and Ser. No. 650,322, Jan. 19, 1976, abandoned. This application Jun. 13, 1978, Ser. No. 915,324
Int. Cl.[3] H01H *33/66*
U.S. Cl. 200—144 B 13 Claims



1. A low voltage vacuum switching means and operating mechanism combination comprising:

(a) at least one low voltage vacuum switch having axially movable conductive support posts sealed to and extending through opposed flexible annular seal members, with electrical contact portions provided at the inwardly extending ends of the support posts within the vacuum switch, and wherein the flexibility of the annular seal members permits axial movement of the support posts to move the electrical contact portions into and out of electrical contact;

(b) mounting means connected to the opposed extending ends of the respective support posts outside the vacuum switch, which mounting means permit electrical connection of the switch to electrical conductor means, with the mounting means connected to the support post on the side of the switch connected to an operating mechanism including a mounting means flexible portion, and the mounting means on the other side of the switch being rigid relative to the mounting means flexible portion;

(c) an operating mechanism connected via the mounting means flexible portion to the extending end of a support

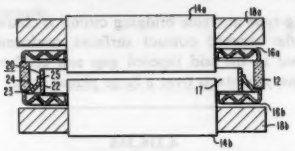
post on one side of the switch, which operating mechanism comprises means for translating a rotary actuating force to an axially directed reciprocal switch closing force for axially flexing the annular seal members and reciprocally moving the support posts to effect opening and closing the switch contact portions.

4,216,360

LOW VOLTAGE VACUUM SWITCH WITH INTERNAL ARCING SHIELD

Sidney J. Cherry, Elmira; Robert M. Hruda, Horseheads, and Paul O. Wayland, Montour Falls, all of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 27, 1978, Ser. No. 928,640
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **12 Claims**



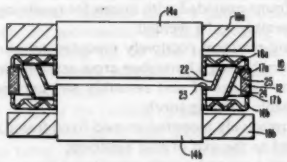
1. A vacuum switch for direct current electrolytic cell shunting operation, which switch is operable with the contacts closed at a high amperage D.C. continuous current, and which will interrupt this continuous current when the contacts are opened at a D.C. voltage across the contacts which is below the voltage at which an arc can be sustained between the contacts within the vacuum switch, which switch comprises an annular insulating body portion, a pair of annular flexible corrugated envelope portions, and a pair of cylindrical conductive contact members aligned along the switch axis, with respective cylindrical conductive contact members sealed to the inwardly extending periphery of the respective annular flexible corrugated envelope portion, and the outwardly extending periphery of each annular flexible corrugated envelope portion being sealed to the annular insulating body portion, the improvement wherein a generally annular arcing shield is disposed within the vacuum switch spaced about the contact ends of the cylindrical conductive contact members between the contact ends and the annular insulating body portion, which generally annular arcing shield extends from and is supported by the annular insulating body portion.

4,216,361

LOW VOLTAGE VACUUM SWITCH WITH PLURAL CONIC SHIELDS ABOUT THE CONTACTS

Leonard A. Salvatore, Watkins Glen, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 17, 1978, Ser. No. 961,789
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **7 Claims**



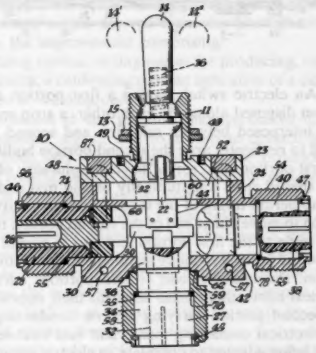
1. A vacuum switch for direct current electrolytic cell shunting operation, which switch is operable with the contacts closed at a high amperage D.C. continuous current, and which will interrupt this continuous current when the contacts are opened at a D.C. voltage across the contact which is below the voltage at which an arc can be sustained between the contacts within the vacuum switch, which switch comprises an annular insulating body portion, a pair of flexible corrugated envelope portions, and a pair of cylindrical conductive contact members sealed to the inwardly extending periphery of the respective annular flexible corrugated envelope portions, and the outwardly extending periphery of each annular flexible corrugated envelope portion is sealed to opposed ends of the annular insulating body portion, and wherein arc shield means are disposed within the switch between the contact end surfaces and the annular insulating body portion, which arc shield means comprises two concentrically spaced-apart generally conic shields, with an inner conic shield extending from one of the cylindrical contacts, and an outer conic shield extends from one end of the annular insulating member, with the inner and outer conic shields substantially overlapping and extending parallel to each other at an angle relative to the switch axis.

4,216,362

SERIES SLIDING CONTACT SWITCH

Sydney S. Simon, 10911 NW. 24th St., Coral Springs, Fla. 33065

Continuation-in-part of Ser. No. 788,108, Apr. 14, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,261
Int. Cl.² H01H *15/04, 63/02*
U.S. Cl. 200—153 S **5 Claims**



1. An ultra-high frequency building block series sliding contact switch, comprising:

a body, said body having a watertight, sealed cavity and at least two apertures therethrough for ganging said switch, said body having a cavity covering portion connected to said body,

a sliding contact mechanism connected to said body and positioned in said cavity including a single generally rectangular sliding knife blade having a bottom contact portion and end contact portions,

an input contact connecting means connected to said body, said input contact connecting means including a feeder connection portion of any design for connnecting an input cable and an input contact portion including a slot positioned to always captively contact said bottom contact portion of said generally rectangular sliding thin knife blade,

at least two output contact connecting means connected to said body, each said output contact connecting means including a load connection portion of any design for connecting an output cable and a slotted output contact portion sized for receiving said end portion of said generally rectangular sliding knife blade contact, said generally rectangular sliding knife blade sized to be captively in

contact and bridge said bottom contact portion and one end contact portion,

a switching assembly removably connected over said cavity to said sliding contact mechanism for longitudinally moving said end portions of said generally rectangular sliding knife blade contact into and out of engagement with said slotted ouput contact portion, said switching assembly includes a toggle switch arm and a biasing means connected between said arm and said sliding contact mechanism, said biasing means for biasing said sliding contact mechanism into one or the other said end contact portion engaging positions and for positioning said toggle arm in said cavity covering portion,

a flexible covering means removably secured to said switching assembly for excluding foreign material from said sliding contact mechanism.

4,216,363

HANDLE SAFETY SWITCH

Thomas J. Nofel, Brookpark, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Division of Ser. No. 812,178, Jul. 1, 1977, Pat. No. 4,161,639.
This application Aug. 7, 1978, Ser. No. 931,844
Int. Cl.[2] H01H *13/08, 1/50*
U.S. Cl. 200—157 **6 Claims**

1. An electric switch having a first portion and a second portion disposed alongside each other, a strip spring of wave form interposed between said first and second portions and biased to resiliently urge the second portion bodily away from the first portion, said spring having a plurality of bearing surfaces spaced apart longitudinally of said first and second portions to permit tilting of the second portion relative to the first portion to move either end of the second portion to be disposed at an angle to the first portion and also to permit both ends of the second portion to move simultaneously relative to the first portion, the said first and second portions carrying spaced electrical contacting means adjacent their opposite ends, and said second portion carrying electric conducting means, the said electrical contacting means and said electric conducting means being adapted to complete an electric circuit, the movement of both ends of the said second portion simultaneously towards said first portion breaking the electric engagement of said electric contact means at both of the said opposite ends of the first and second portions, to interrupt said circuit, and the movement of one end of said second portion toward said first portion a distance more than any movement of the other end of the second portion toward said first portion breaking the engagement of the electric contacting means at least one of said opposite ends of the first and second portions.

4,216,364

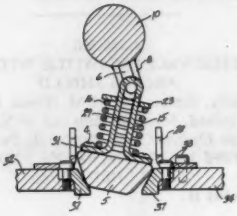
HIGH CURRENT CELL-SHORTING SWITCHES

Martin H. Dempsey, Stratford, and James F. Rooney, Bethany, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 4, 1978, Ser. No. 966,136
Int. Cl.[2] H01H *1/38*
U.S. Cl. 200—164 R **20 Claims**

1. In a short circuiting switch comprising a pair of cooperating contacts for opening and closing an electrical circuit, said cooperating contacts comprising at least one plug-type shaft-thrown, rotatably-engaged movable bridging contact and at least one pair of bus bars having bus terminals forming stationary contacts of a shape to receive said bridging contact, the improvement wherein:

said pair of bus terminals is characterized by beveled edges forming two stationary contact surfaces defining a straight-sided tapered gap between said pair, said taper being in the the direction away from said bridging contact, and



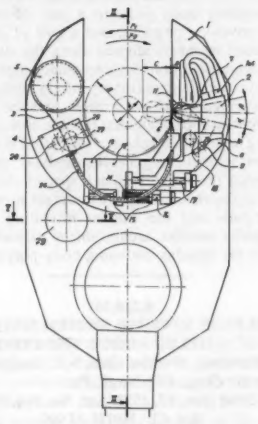
said plug-type movable bridging circuit is characterized by two flat tapered contact surfaces conforming to and adapted to fill said tapered gap and contact with said stationary contacts over a large planar area.

4,216,365

MACHINE FOR WELDING PROVIDED WITH A ROTARY PLATFORM

Jean-Pierre Peyrot, 8 Domaine du Bel Abord, 91380 Chilly Mazarin, France

Filed Sep. 20, 1978, Ser. No. 944,231
Claims priority, application France, Sep. 20, 1977, 77 28336
Int. Cl.[2] B23K *9/02*
U.S. Cl. 219—60 A **3 Claims**



1. In a machine for the automatic welding of circular assemblies:

a fixed frame provided with means for receiving and holding an assembly to be welded;

a welding-platform rotatively mounted on said frame, said platform having a horseshoe cross-section about a housing for the passage of said assembly and carrying a radially adjustable welding-torch;

a drum rotatively mounted no said fixed frame about an axis parallel to the axis of said platform;

a first and a second spools constituted by a portion of said platform and a portion of said drum, respectively;

a first and a second crown-gears formed at the periphery of said platform and of said drum, respectively;

means for feeding said torch, said means being connected to

said torch by coupling-members fixed with respect to said torch, on the one hand, and to fixed sources by means of rotary coupling-members of said drum, on the other hand;

sheaths for guiding said feeding means, one end of which is fixed to said drum while the other end is fixed to said platform, said sheaths being caused to be wound in the same direction about a first take-up spool formed by said platform and a second take-up spool formed by said drum; and

means for rotatively driving said platform and drum simultaneously in either direction, said means comprising an endless belt in mesh with said crown-gears of said platform and drum and with a driving pinion, about which said belt forms re-entrant loops, and guided by idle wheels about which it also forms re-entrant loops, and resilient return means for maintaining said belt taut, so as to offset the distorsions of said belt when it passes above said platform opening.

4,216,366

RESISTANCE WELDER WITH A CUTTER

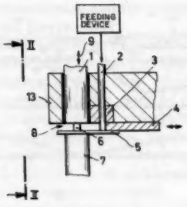
Heinz Finzer, Industriestrasse 9, 7880 Säckingen 11, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,650

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717266

Int. Cl.² B23K *11/00*

U.S. Cl. 219—78.15 **12 Claims**



1. A welding machine comprising:

a welding electrode movably disposed along a given line;

a support material disposed in the path of said welding electrode;

a cutter movable at right angles to said given line of movement of said welding electrode;

a counter-electrode disposed opposite said support material from said welding electrode and supporting said support material; and

means including a cutting tip for gradually supplying an elongated contact material along a path parallel to said given line of movement of said welding electrode, through the cutting tip, to said support material, said contact material being supplied between said cutter and said welding electrode,

the cutting edges of the cutting tip and of the cutter having profiles corresponding to one another and the welding electrode being provided with a contact profile corresponding to that of the cutting tip;

whereby said contact material is sheared off by said cutter into a contact pill and has a sheared surface whose profile is complementary with said contact profile of said welding electrode.

4,216,367

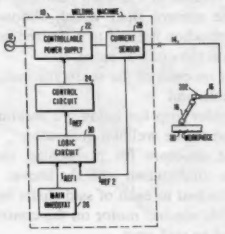
WIRELESS REMOTE CONTROL FOR ELECTRIC WELDER

Robert L. Risberg, Brookfield, Wis., assignor to Miller Electric Manufacturing Company, Appleton, Wis.

Filed Apr. 18, 1978, Ser. No. 897,610

Int. Cl.² B23K *9/10*

U.S. Cl. 219—132 **12 Claims**



1. In an arc welding machine having a controllable power supply for controllably supplying welding current to a workpiece through a welding cable and electrode holder, said machine containing an internal manually adjustable welding current setting means coupled to said power supply for controlling a pre-set magnitude of the welding current in response to an internal control signal derived from the internal current setting means, the improvement comprising:

remote welding current setting means for producing, via the welding cable, a calibrating current indicative of a desired magnitude of welding current; and

comparison means at said machine and responsive to said internal control signal, and to a remote control signal derived from said calibrating current, for producing a modified remote control signal indicative of said desired magnitude of welding current; and

wherein said remote welding current setting means comprises continuously adjustable remote resistor means of predetermined minimum resistance and adapted to be removably connected in series between the electrode holder and the workpiece, said minimum resistance being sufficiently high so as not to permit an arc to be struck when said resistor means is connected;

said continuously adjustable resistor means producing an infinite number of calibrating current values corresponding to an infinite number of desired magnitudes of welding current.

4,216,368

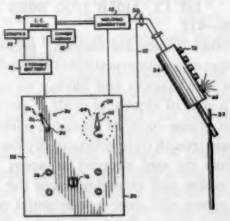
REMOTE CONTROL DEVICE FOR ARC WELDING

Calvin J. Delay, 406-B S. Fannin, Amarillo, Tex. 79106

Filed Nov. 27, 1978, Ser. No. 964,251

Int. Cl.² B23K *9/10*

U.S. Cl. 219—132 **1 Claim**



1. In a welding machine having

a. an internal combustion engine,
b. a storage battery for starting the internal combustion engine,
c. charging means for keeping the storage battery charged,
d. a welding generator driven by the internal combustion engine,
e. a control panel for the welding generator having
(i) a coarse control shaft which chooses a coarse control when rotated to a desired position,
(ii) a fine control shaft which chooses a position of a rheostat when rotated to a desired position,
f. a cover on the control panel,
g. a pointer on each of the shafts for indicating the position of the shaft, and
h. a rod holder grip for holding a welding rod electrically connected to the welding generator;
the improved structure for positioning each of said shafts comprising in combination with the above:
j. a gear attached to each of said shafts beneath the cover,
k. a reversible electric motor on the control panel drivingly connected to said gear,
m. electrical connections from each of said motors to said storage battery,
n. said electrical connections including rod holder grip switches upon the rod holder grip for actuating the motors either in a forward or a reverse direction,
o. a key switch upon the control panel cover,
p. said key switch being operable only by a key,
q. panel switches on the control panel,
r. said key switch selecting between
(i) said panel switches, and
(ii) said grip switches as to which control said reversible motors,
s. a limit switch on the control panel,
t. connection means for connecting said limit switch to one of the motors to inactivate the motor,
u. a magnet mounted upon the gear to magnetically control the limit switch, and thus
v. inactivate the motor,
w. an indicator lamp upon the rod grip handle,
x. a magnetically sensitive reed switch mounted upon the control panel,
y. at least one magnet attached to one of said gears so that when the magnet is near the reed switch, the indicator lamp will light.

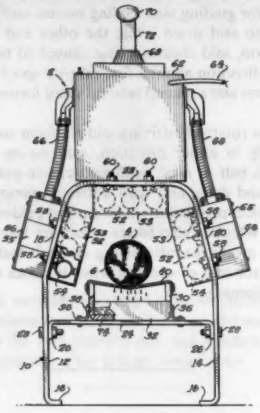
4,216,369

DEVICE FOR CLEANING GREASE-FILLED CABLE STUB

Frederick W. Burtelson, Harvard, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed Aug. 11, 1978, Ser. No. 933,056
Int. Cl.[2] H05B *3/00*; B08B *7/00*
U.S. Cl. 219—411 **14 Claims**

1. A portable device for cleaning grease from around the insulated wires of an electrical cable stub comprising a support, a trough on said support and having an open top, means for supporting a stub of electrical cable in proximity to said open top such that grease covered insulated wires are exposed to the interior of said trough over substantially the length of said stub, heating means on said support adjacent to said cable stub supporting means and extending over the length of said stub supporting means and over a substantial peripheral extent of said supporting means for melting the grease such that the melted grease drains into said trough for collection therein, and means for maintaining the heat at a level that avoids damage to the insulation of the wires, said cable stub supporting means comprising a material that has sufficiently low heat



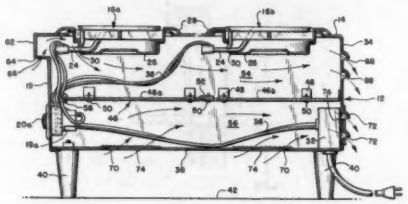
absorption characteristics to prevent the formation of hot spots on the cable which might damage the insulation of the wires.

4,216,370

ELECTRIC COUNTERTOP COOKING APPLIANCE

Charles J. Charvat, Holcombe, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Continuation of Ser. No. 724,321, Sep. 17, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,203
Int. Cl.[2] H05B *3/68*; A47S *37/08*
U.S. Cl. 219—460 **11 Claims**



1. An electric countertop cooking appliance adapted to be cooled by the flow of air therethrough, said appliance comprising:
a case having opposed top and bottom walls and interconnected side walls including opposed front and rear walls, said side walls extending between and interconnecting said top and bottom walls and said top wall having an opening therein; baffle plate means for dividing said case into upper and lower compartments and preventing the flow of air between said compartments, said baffle plate means extending within said case in spaced parallel relation with the top and bottom walls;
means including an electric heating element mounted in the opening in the top wall of said upper compartment for providing cooking heat;
means for energizing said heating element including control means mounted within the lower compartment on one of the walls of said case, said control means being electrically coupled to said heating element and having means extending through said one wall for operating said control means to control the heating element; and
the case walls of said upper and lower compartments having respective air inlet openings for admitting air into said compartments and respective air outlet openings for dis-

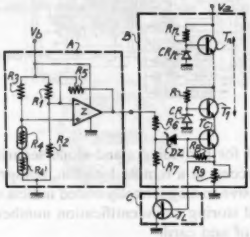
charging air from said compartments, said air inlet and outlet openings in each of said compartments being spaced apart and cooperating with said baffle plate means to induce a separate convectional cooling air flow through each of said compartments.

4,216,371

DEVICE FOR HEAT REGULATION OF AN ENCLOSURE PARTICULARLY FOR OSCILLATING PIEZOELECTRIC CRYSTAL, AND ENCLOSURE COMPRISING SUCH A DEVICE

Gérard Marotel, Sartrouville, France, assignor to Compagnie D'Electronique et de Piezoelectricite C.E.P.E., Sartrouville, France

Filed Feb. 27, 1979, Ser. No. 16,137
Claims priority, application France, Mar. 3, 1978, 78 06100
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—501 **11 Claims**



1. A temperature regulating apparatus for developing and maintaining a predetermined temperature level within an enclosure comprising:

temperature measuring circuit means for sensing the temperature within said enclosure and for generating a temperature signal related thereto; and

heating circuit means coupled to said temperature measuring circuit means including a plurality of semiconductor heating circuit elements having their respective collector-emitter paths coupled in series, each of them constituting a means for providing a stable voltage drop across their respective collector-emitter paths, each stage producing the same amount of heat when a heating current passes therethrough, the amplitude of said heating current being responsive to said temperature signal.

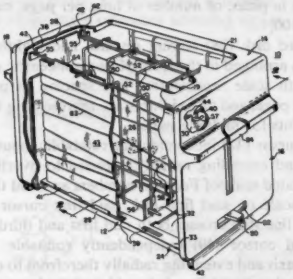
4,216,372

TOASTER CHASSIS ASSEMBLY

Peter E. Huggler, Columbia, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Feb. 26, 1979, Ser. No. 15,195
Int. Cl.[2] H05B *3/06*; A47J *37/08*
U.S. Cl. 219—521 **10 Claims**

1. An electric toaster chassis assembly for supporting at least two heating card elements in a vertical position, spaced from each other in generally parallel relation to define a bread-receiving slot therebetween, each said heating element card having spaced tabs along the upper and lower edges thereof, respectively, said toaster chassis assembly including a combination: a horizontal base; first and second end walls, each joined at a first end thereof to an end of said base, and extending vertically upwardly therefrom; said base including a plurality of spaced slots for receiving the lower tabs of said heating element cards to position said cards with the plane thereof extending, perpendicular to said end walls, and securing means predeterminedly spaced from said tab receiving slots; at least two bread guard means, each including a plurality of elements joined together in spaced relation to form a grille member, said bread guard means each including upper and lower elements, said lower elements being engagable by said securing means for positioning each said bread guard means between said end walls in spaced relation with respect to said heating element cards thereby permitting a bread slice to be received between said bread guards means, said second, free ends of said end walls of said toaster chassis assembly each including means for



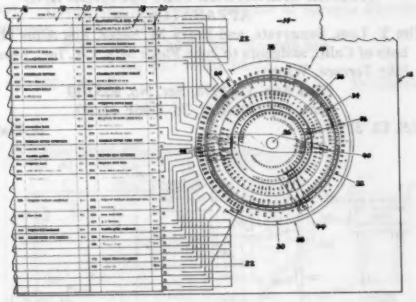
engaging said upper elements of said bread guard means, said securing means and upper engaging means retaining said bread guard means in an upstanding position, said upper elements of said bread guard means being offset for engaging said upper tabs on opposite sides of said heating element cards, thereby to support the latter at the upper ends thereof.

4,216,373

METHOD AND APPARATUS FOR COPY-FITTING

Charles R. Seely, 6870 Dorinda Dr., Riverside, Calif. 92503

Filed Nov. 7, 1977, Ser. No. 848,904
Int. Cl.[2] G06C *3/00*
U.S. Cl. 235—88 R **2 Claims**



1. A copyfitting calculator comprising:

a base member (32) having a first graduated scale of Font ID numbers extending along a portion of a circular arc having its center at a pivot axis (26); and a second graduated scale of type size, in points, extending along the remainder of said circular arc, said Font ID numbers being a function of the width, in points, of the alphabet length of various fonts, ranging from the most condensed to the most extended styles in general use;

first, second and third concentric disks (34, 36 and 38) of graduated diameters mounted on said base member and rotatable about said pivot axis, said first disk (34) having a third graduated scale of line length, in picas, extending along a portion of the edge thereof; a fourth graduated scale of characters per line extending along the remainder of said edge; and a fifth graduated scale of characters per page, manuscript or book, said fifth scale being arranged in the form of an inner ring spaced radially inward from said third and fourth scales, said fifth scale forming a

numerical continuation of said fourth scale from the 100 mark and extending up to 1,000,000, said first disk being of a diameter such that said first and second scales of said base member are displayed just outside the periphery of the first disk;

said second disk (**36**) having a sixth graduated scale of page depth in picas, or number of lines per page, ranging from 1 to 100;

said third disk (**38**) having seventh and eighth graduated scales arranged in the form of two concentric circles, said seventh scale representing line spacing in points for a single page, and said eighth scale representing line spacing in points for multiple pages;

a first cursor (**42**) independently rotatable about said pivot axis and extending radially outward to overlie said first graduated scale of Font ID numbers and said third graduated scale on said first disk, said first cursor having an index line that crosses both said first and third scales;

a second cursor (**40**) independently rotatable about said pivot axis and extending radially therefrom to overlie said fifth scale on said first disk, said sixth scale on said second disk, and said seventh and eighth scales on said third disk;

a third cursor (**44**) fixed to said second disk (**36**) and rotatable therewith, said third cursor having its index line set on the numeral "1" of said sixth scale and extending radially outward to overlie said scales on said base member (**22**) and on said first disk (**34**); and

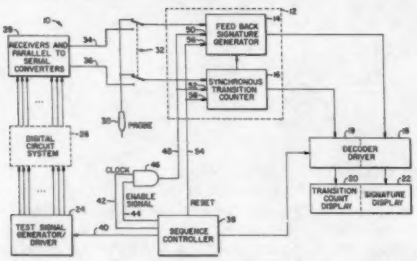
a fourth cursor (**46**) fixed to said third disk (**38**) with its index line positioned on the numeral "12" of said seventh scale, said fourth cursor projecting radially to overlie said sixth scale on said second disk.

4,216,374

HYBRID SIGNATURE TEST METHOD AND APPARATUS

Tim Y. Lam, Sunnyvale, and Barry M. Saper, Los Altos Hills, both of Calif., assignors to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Aug. 11, 1978, Ser. No. 933,019
Int. Cl.[2] G01R *31/26;* **G06F** *11/00*
U.S. Cl. 371—27 **10 Claims**



1. A method for generating a digital test signature word having a predetermined length for use in testing a digital electronic circuit system wherein the circuit system is stimulated by a preselected pattern of bits of a digital signal to produce an output pattern of bits at a preselected location of said circuit system, said generating method comprising the steps of:

tallying the number of transitions of said output pattern of bits to produce at least one transition count defining a first portion of said signature word; and

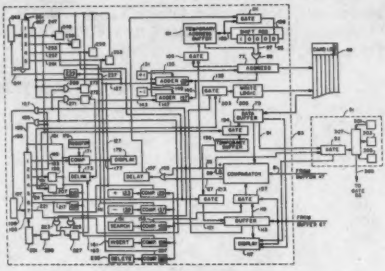
combining a selected plurality of said output pattern of bits with preselected other ones of said output pattern of bits to produce a second portion of said signature word.

4,216,375

SELF-CONTAINED PROGRAMMABLE TERMINAL FOR SECURITY SYSTEMS

Bryan D. Ulch, Valencia; Donald P. Sturgis, Claremont, and Robert J. Fox, Los Angeles, all of Calif., assignors to A-T-O Inc., Willoughby, Ohio

Division of Ser. No. 874,283, Feb. 1, 1978. This application Mar. 12, 1979, Ser. No. 19,733
Int. Cl.[2] G06K *5/00*
U.S. Cl. 235—382 **14 Claims**



1. A terminal for providing stand-alone security for selectively limiting access at a remote location, comprising:

means responsive to magnetically coded indicia on a card for reading and storing an indentification number peculiar to the holder of said card;

a memory at said terminal for storing a plurality of said identification numbers;

means for comparing said identification number stored by said reading and storing means with said identification numbers stored in said memory, and for providing selective access based on said comparison; and

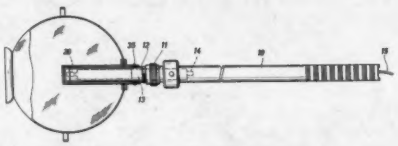
means for adding and deleting identification numbers at said memory without affecting the total identification number storage capacity of said memory.

4,216,376

NEUTRON INTERFACE DETECTOR

Leonard H. Griffin, Pasadena; Richard H. Hunt, and Alexander Telfer, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 22, 1978, Ser. No. 918,120
Int. Cl.[2] G01F *23/00;* **G01T** *3/00*
U.S. Cl. 250—357 **5 Claims**



1. An apparatus using the scattering of fast neutrons by a hydrogen-containing liquid to measure the level of the liquid in an enclosed vessel, said apparatus comprising:

an elongated probe, a source of fast neutrons, said probe in addition having a detachable end piece, said source being mounted in said detachable end piece, the distance between the detachable end piece and the opposite end of the probe being sufficient to reduce the radiation level at said opposite end to no more than 2.5 millirems per hour when said source is less than 500 microcuries;

a slow neutron detector, said detector being mounted on said probe adjacent said detachable end piece; and,

circuit means coupled to said slow neutron detector for measuring the response of said slow neutron detector as said probe is moved tangentally along the exterior surface of said enclosed vessel.

4,216,377

LIGHT SCATTERING SMOKE DETECTOR

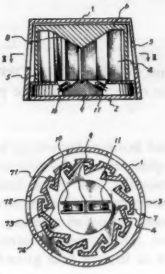
Mitsuo Hasegawa, Tokyo; Yoshinori Shinohara, Tama; Takashi Suzuki, Tokyo, and Akira Yokota, Hino, all of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Filed Jun. 22, 1978, Ser. No. 918,098

Claims priority, application Japan, Jun. 27, 1977, 52-84479[U]; Jun. 27, 1977, 52-84480[U]

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—574 **5 Claims**



1. A light scattering smoke detector comprising a detection chamber having a substantially cylindrical side wall and first and second end walls which close both ends of said side wall, a light source for emitting a light within said detection chamber, a light sensing element for sensing said light scattered by smoke particles entering the detection chamber, said light source and light sensing element being so located that said light source does not irradiate directly onto said light sensing element, said side wall comprising of a plurality of substantially identical spaced vertical laminae positioned at substantially equal circumferential intervals, each of said laminae being shaped to provide a straight portion and at least an angular knife-like ridge portion directed to the interior of said detection chamber and overlapping the straight portion of the adjoining laminae to form a serpentine path between the adjoining laminae, whereby the smoke particles can freely enter said chamber through said serpentine path and the light from said light source is effectively reflected out of said side wall but not back to said light sensing element.

4,216,378

OPTICAL SCANNER

William A. Monette, Kettering, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Oct. 10, 1978, Ser. No. 950,253

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **15 Claims**

1. An optical scanner for scanning an image on a document to produce an electrical signal representing the image density of the image at successively scanned points positioned along a scan line on the document, comprising:

platen means for supporting a document,

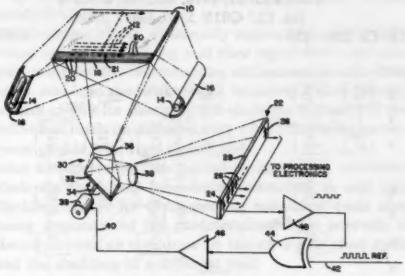
reference grating means positioned adjacent said platen means and defining a plurality of position indicating indicia thereon,

photoelectric transducer means including reference transducer means and a scanning transducer means, each of said transducer means providing an electric output signal in response to the intensity of light incident thereon,

means for illuminating said image on said document and said reference grating means,

scanner optical means, including a rotatable mirror, for directing light reflected from points positioned along scan lines on said grating means and said image to said reference transducer means and said scanning transducer means, respectively, as said mirror is rotated,

means for supplying a reference scanning signal,



comparator means for comparing the output of said reference transducer means with said reference scanning signal to provide a mirror position control signal, and

motor means for rotating said mirror in response to said mirror position control signal,

whereby said image is scanned by said scanning transducer means at a scan rate along said scan line, which scan rate is controlled by said reference scanning signal.

4,216,379

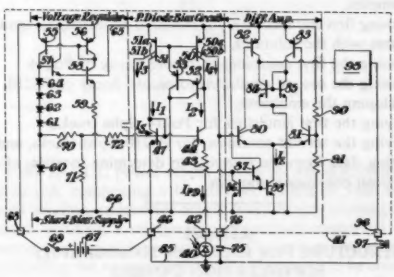
LOW VOLTAGE BIAS CIRCUIT FOR A PHOTO-DIODE

Robert C. Genesi, Sterling, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Oct. 26, 1978, Ser. No. 955,086

Int. Cl.[2] H01J *39/12*

U.S. Cl. 250—214 P **10 Claims**



1. A low voltage bias circuit for a photo-diode comprising two d.c. power supply busses; a first bipolar transistor; a bipolar input device having at least one p-n junction, said photo-diode being connected between the emitter of said first transistor and one of said busses, said p-n junction being connected between the base of said first transistor and said one buss, the polarity of connection of the base-emitter junction of said first transistor being opposite to that of said p-n junction and of said photo-diode in the circuit loop containing all three in series whereby the photo-current generated by said photo-diode in response to light impinging thereon flows in the collector of said first transistor when said first transistor is on; and a current mirror circuit means being connected to the other of said busses and having an input connected to said collector of said

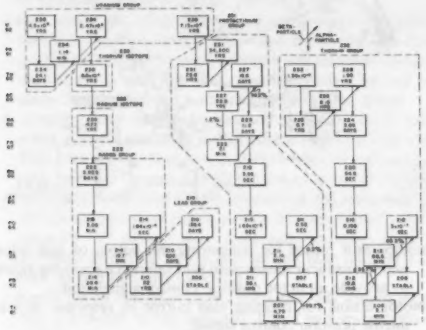
first transistor for producing a feed-back current in the forward direction through said p-n junction that is substantially proportional to said photo-current.

4,216,380

FIELD METHOD FOR DETECTING DEPOSITS CONTAINING URANIUM AND THORIUM

Lorin R. Stieff, P.O. Box 263, Kensington, Md. 20795

Filed Feb. 21, 1978, Ser. No. 879,578
Int. Cl.[2] G01V *5/00*; G01T *5/00*
U.S. Cl. 250—255 **4 Claims**



1. A field method for detecting and locating a deposit containing uranium and for distinguishing between uranium or thorium-containing deposits having characteristic radioactive daughter product matter near the deposit comprising

collecting subsurface samples from a vicinity of the deposit,

studying the samples for characteristic radioactive daughter product matter, which is a mixture of Pb214, Bi214, Po214, Pb210, Bi210 and Po210 detected by the alpha decay of Po214 and Po210 respectively in samples collected in the vicinity of a deposit containing U238, by steps further comprising

chemically extracting Pb, Bi and Po in solutions from the samples,

exposing first and second alpha sensitive photographic emulsions with the solutions,

exposing the first emulsions to record decay of Po214,

exposing the second emulsions to record decay of Po210,

developing the emulsions,

studying the first emulsions for Po214 alpha tracks,

studying the second emulsions for Po210 alpha tracks, and

plotting data from the studying to determine location of a deposit containing uranium.

4,216,381

STRUCTURE FOR EMISSION TOMOGRAPHY SCINTILLATION CAMERA

Kai Lange, Vedbaek, Denmark, assignor to General Electric Company, Milwaukee, Wis.

Filed May 10, 1979, Ser. No. 37,661
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **7 Claims**

1. A structure for a scintillation camera having a detector adapted for emission tomography analysis of a patient, comprising:

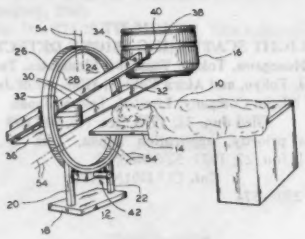
a base;

an upright stanchion mounted on said base;

an upright circular frame, having a central longitudinal axis, mounted on said stanchion;

an elongated frame pivotally supporting the detector at one end and having a counterweight at the other end, having means for mounting the lateral axis of balance of said elongated frame tiltably within said circular frame;

means for tilting said elongated frame relative to the central longitudinal axis; and



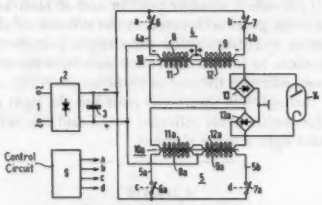
means for rotating said elongated frame within said circular frame, whereby the detector orbits the patient to receive emission data.

4,216,382

X-RAY DIAGNOSTIC GENERATORS WITH AN INVERTER FEEDING ITS HIGH VOLTAGE TRANSFORMER

Kurt Franke, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,583
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1978, 2814320
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—408 **3 Claims**

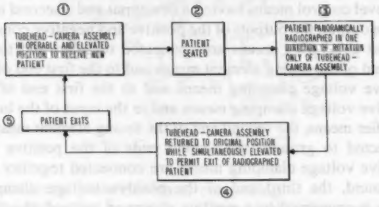


1. An x-ray diagnostic generator with an x-ray tube, high voltage transformer means feeding the x-ray tube, an inverter circuit connected to the input of the high voltage transformer means, and a power rectifier feeding the inverter, characterized in that the inverter circuit comprises two inverters (**4** and **5**) of which each has pulsing means (**6**, **7**, **6***a*, and **7***a*) controlled for the alternate connection of the transformer means to the power rectifier (**2**), and in that the control signals supplied to the inverters (**4** and **5**) are out of phase with one another, said transformer means comprising two high voltage transformers (**10** and **10***a*), whose secondary windings (**11**, **12**, **11***a*, and **12***a*) are each connected with one high voltage rectifier (**13**, **13***a*, **15**, **17**, **19**, **21**, **24**, and **26**), and whose primary windings (**8**, **9**, **8***a*, **9***a*) are each connected to one inverter output (**4***a*, **4***b*, **5***a*, and **5***b*).

4,216,383
EXPEDITIOUS UNI-DIRECTIONAL PANORAMIC DENTAL RADIOGRAPHY

Robert H. Cushman, Princeton; Fred W. Hart, Jr., Barnegat, both of N.J.; David R. Kircher, and Anthony Ciavattoni, both of Staten Island, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Oct. 2, 1978, Ser. No. 947,366
Int. Cl.² G03B *41/16*
U.S. Cl. 250—439 P **3 Claims**


①
②
③
TUBEHEAD – CAMERA ASSEMBLY IN OPERABLE AND ELEVATED POSITION TO RECEIVE NEW PATIENT
PATIENT SEATED
PATIENT PANORAMICALLY RADIOGRAPHED IN ONE DIRECTION OF ROTATION ONLY OF TUBEHEAD – CAMERA ASSEMBLY
⑤
PATIENT EXITS
TUBEHEAD – CAMERA ASSEMBLY RETURNED TO ORIGINAL POSITION WHILE SIMULTANEOUSLY ELEVATED TO PERMIT EXIT OF RADIOGRAPHED PATIENT
④

1. In a rapid and improved method for radiographing dental patients in one direction of rotation only of a tubehead-camera assembly associated with low silhouette panoramic dental X-ray machine which method enhances the expeditious handling rate of said patients being processed for said one-direction panoramic dental radiographing, said process comprising

operably positioning said patient in a chair associated with said machine,

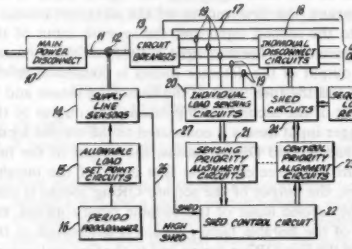
panoramically radiographing dental arch area of said positioned patient by orbiting in one direction of rotation said tubehead-camera assembly about head of said patient,

automatically returning said tubehead-camera assembly after said orbit in an opposite direction of rotation while simultaneously elevating said tubehead-camera assembly comprising a total patient time substantially equivalent to patient time in taking a radiograph on a substantially equivalent machine taking successive radiographs in alternate directions of rotation of tubehead-camera assembly.

4,216,384
SYSTEM FOR MONITORING AND CONTROLLING ELECTRIC POWER CONSUMPTION

Frederick A. Hurley, Miami, Fla., assignor to Directed Energy Systems, Inc., Miami, Fla.

Filed Dec. 9, 1977, Ser. No. 859,099
Int. Cl.² H02J *13/00*
U.S. Cl. 307—39 **18 Claims**



15. A system for monitoring and controlling the electrical amperage draw of an installation supplied by an electrical supply line, said installation having therein a number of individual loads to be controlled, comprising:

a supply line sensor coupled to the electrical supply line for generating a supply line sensing signal proportional to the amperage flowing in the supply line;

an allowable load set point indicator for designating the maximum allowable amperage draw, and for receiving said supply line sensing signal from said supply line sensor, to generate an overdraw signal whenever the amperage flowing in the supply line exceeds the maximum allowable amperage draw;

control means for receiving the overdraw signal from said allowable load set point indicator for generating a shed signal directing the shedding of particular individual loads so as to decrease the electrical amperage draw of the installation;

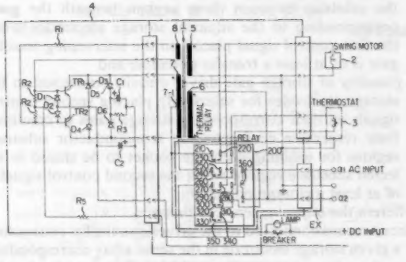
a load shedding circuit electrically connectable to the individual loads for receiving said shed signal from said control means and for disconnecting said particular individual loads, said load shedding circuit including a shed priority control circuit for changing the shedding sequence of the individual loads on different shed cycles following occurrence of said overdraw signal; and

a timer for controlling the period during which individual loads are shed, said timer being connected to said load shedding circuit for re-connecting individual loads after being disconnected for predetermined time intervals to thereby create an overdraw to initiate a new shed cycle and the shedding of a different load.

4,216,385
AC/DC POWER SUPPLY DEVICE

Morikazu Omura, Urawa; Akio Kobayashi, Gyota, and Yukio Okuda, Fukaya, all of Japan, assignors to Sawafuji Electric Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1978, Ser. No. 955,265
Claims priority, application Japan, Nov. 10, 1977, 52-135081; Feb. 3, 1978, 53-11301; Feb. 3, 1978, 53-11302; Feb. 3, 1978, 53-11303
Int. Cl.² H02J *9/04*
U.S. Cl. 307—64 **27 Claims**



1. An AC/DC power supply device for use in a refrigerator drive unit comprising a transformer having at least an AC input winding, an inverter output terminal side winding and an output winding; a refrigerator compressor connected to the output winding and operated by AC power, a thermostat for controlling the temperature of the refrigerator to be cooled by the operation of the refrigerator compressor; an AC power source interchangeably connected to the AC input winding so that an AC power source voltage is applied to the AC input winding; an inverter circuit connected to the inventer output terminal side winding; a DC power source interchangeably connected to the inverter circuit so that a DC power source voltage is applied to the inverter circuit; a switching section for selectively switching over an AC operation mode in which the AC power source is connected to the AC input winding and a DC operation mode in which the DC power source is connected to the inverter circuit, characterized in that the AC/DC power supply device has such a construction that the thermostat turns on and off a DC power source voltage supply circuit to the inverter circuit in the DC operation mode, the inverter circuit has a smoothing capacitor for smoothing the

DC power source voltage, and the switching section has a breaking circuit for maintaining the circuit connecting the inverter output terminal side winding and the smoothing capacitor in the off state during the AC operation mode.

4,216,386

CHARGE COUPLED DEVICE WITH REDUCED POWER CONSUMPTION UPON CHARGE TRANSFER

Charles E. Boettcher, Sandy, Utah, assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 24, 1979, Ser. No. 5,994
Int. Cl.[2] G11C *19/28;* H01L *29/78*
U.S. Cl. 307—221 D **5 Claims**

1. A charge-coupled device comprising

a semiconductor substrate;

an insulative dielectric layer covering the substrate;

a serial array of electrodes defining a serial array of corresponding gates in the dielectric layer; wherein alternate electrodes are transfer electrodes and storage electrodes respectively;

a plurality of transfer gate driver circuits connected to the transfer electrodes for selectively placing first control signals on their corresponding transfer gates to condition their respective corresponding semiconductor substrate regions for enabling a charge packet to be transferred in the substrate between those regions beneath the gates corresponding to the adjacent storage electrodes when the first control signal placed on the intervening transfer gate is of at least a transfer potential; and

a plurality of storage gate driver circuits connected to the storage electrodes for selectively placing second control signals on their corresponding storage gates to condition their respective corresponding semiconductor substrate regions for enabling a charge packet to be stored in selected substrate regions when the second control signal is of at least a storage potential;

wherein the improvement comprises;

circuit means connected to the driver circuits for connecting a given storage electrode in the serial array corresponding to the substrate region from which a charge packet is to be transferred to an adjacent electrode corresponding to an uncharged substrate region to initiate transfer of the charge packet from the substrate region corresponding to the given storage electrode.

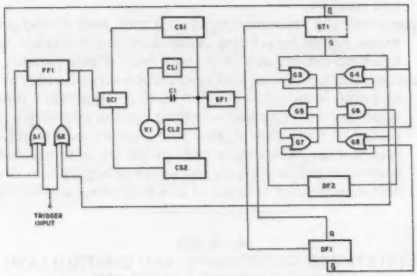
4,216,387

SAWTOOTH WAVEFORM GENERATOR

Lockwood W. Reed, Middletown, N.J.

Continuation-in-part of Ser. No. 700,144, Jun. 28, 1976, abandoned. This application Dec. 20, 1977, Ser. No. 862,413
Int. Cl.[2] H03K *4/50*
U.S. Cl. 307—228 **9 Claims**

1. A device, for generating a first and a second sawtooth waveform derived from a first and a second triangle waveform, comprising a positive constant current generating means having an output and an input, a negative constant current generating means having an output and an input, a timing element means having a first end and a second end, a positive voltage clamping means having a first end and a second end and a third end, a negative voltage clamping means having a first end and a second end and a third end, a buffer amplifier means having an input and an output, a detector means having an input and a first output and second output, and inverting means having an input and a first output and second output, a switching means having a first input through and including an eighth input and a first output and second output, a first positive logic ORing means having a first input through and including a third input and an output, a second positive logic ORing means having a first input through and including a third input and an output, a bistable binary means having a first input and a second input and a first output and a second output, an external trigger input means having an output, and a symmetry and level control means having a first input and a second input and an output, the outputs of the positive and negative constant current generating means are connected together and to the first end of the timing element means and to the first end of the positive voltage clamping means and to the first end of the negative voltage clamping means and to the input of the buffer amplifier means, the second end of the timing element means is connected to ground, the second ends of the positive and negative voltage clamping means are connected together and to ground, the third end of the positive voltage clamping means is connected to a positive source of voltage, the third end of the negative voltage clamping means is connected to a negative source of voltage, the output of the buffer amplifier means is connected to the input of the detector means and to



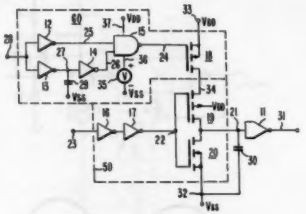
the input of the inverting means, the first output of the inverting means is connected to the first input and the third input of the switching means, the second output of the inverting means is connected to the sixth input and the eighth input of the switching means, the first output of the detector means is connected to the second input and the seventh input of the switching means and to the first input of the first ORing means, the second output of the detector means is connected to the fourth input and the fifth input of the switching means and to the first input of the second ORing means, the output of the external trigger input means is connected to the second inputs of the first and second ORing means, the output of the first ORing means is connected to the first input of the bistable binary means, the output of the second ORing means is connected to the second input of the bistable binary means, the first output of the bistable binary means is connected to the third input of the first ORing means and to the first and second inputs of the symmetry and level control means, the second output of the bistable binary means is connected to the third input of the second ORing means, the output of the symmetry and level control means is connected to the inputs of the positive and negative constant current generating means, the first output of the switching means produces the first sawtooth waveform, and the second output of the switching means produces the second sawtooth waveform.

4,216,388

NARROW PULSE ELIMINATOR

Robert E. Wilson, Whitehouse Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 7, 1978, Ser. No. 931,746
Int. Cl.[2] H03K 5/20
U.S. Cl. 307—234 7 Claims



1. A narrow pulse eliminator comprising:

input and output terminals, said input terminal receptive of a signal alternating between first and second states defining input signal pulses of differing time duration;

a first capacitor having a first plate connected a point of reference potential and having a second plate connected to a first node;

a threshold detector having an input connected to said first node and having an output connected to said output terminal;

a pulsed current source, responsive to a pulsed signal of a prescribed frequency, for supplying predetermined current pulses at intervals related to said prescribed frequency;

switch means responsive to said input signal on said input terminal for connecting said first node to said pulsed current source when said input signal is in said first state so that said predetermined current pulses accumulate charge on said first capacitor, and for connecting said first node to a point of constant potential, relative to said reference potential, when said input signal is in said second state so that substantially all of said accumulated charge is dissipated;

wherein said threshold detector provides an output indication responsive to only those input signal pulses which exceed a specified pulse duration in said first state long enough for said pulsed current source to charge said first capacitor to a voltage level exceeding the threshold of said threshold detector.

4,216,389

BUS DRIVER/LATCH WITH SECOND STAGE STACK INPUT

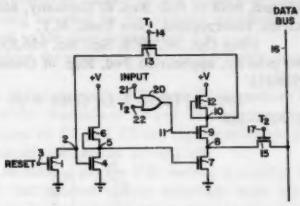
Ernest A. Carter, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 25, 1978, Ser. No. 945,740
Int. Cl.[2] H03K 3/281, 3/353
U.S. Cl. 307—247 R 12 Claims

1. A latching circuit for storing a binary logic state comprising:

(a) first means having a first and a second input terminal and having a first and a second output terminal, said first input terminal being for receiving an inverted feedback signal, said second input terminal being for receiving an input signal to be latched by said latching circuit, said first output terminal being for providing an output signal corresponding to the binary logic state stored by the latching circuit, and said second output terminal providing a feedback signal corresponding to the binary logic state stored by said latching circuit,

(b) second means having an input terminal and an output terminal, the input terminal being for receiving the feedback signal, and the output terminal being coupled to the first input terminal of said first means for providing said inverted feedback signal, and



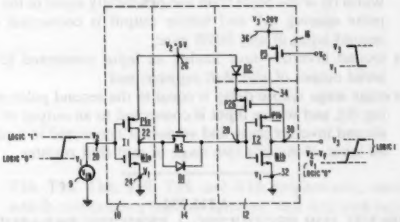
(c) first controllable coupling means coupled between the second output terminal of said first means and the input terminal of said second means for coupling the feedback signal to said second means.

4,216,390

LEVEL SHIFT CIRCUIT

Roger G. Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1978, Ser. No. 948,509
Int. Cl.[2] H03K 5/02, 3/353, 17/10
U.S. Cl. 307—264 10 Claims



1. A level shift circuit comprising:

an input point at which are generated data signals varying in amplitude between a first voltage level and a second voltage level;

a latch circuit having at least one stable state;

a gating transistor having a conduction path and a control electrode, the conduction path of said transistor being connected between said input point and said latch circuit, and means for applying a turn on potential to said control electrode for transferring data between said input point and said latch for setting said latch to a condition representative of the value of the input signal;

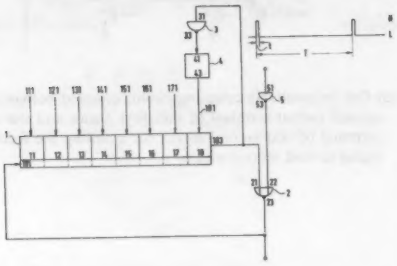
means for applying a first operating potential across said latch circuit of similar value to the dirrerence in the potential between the levels of said data signals, during the time data signals are transferred to said latch circuit; and

means for applying a second operating potential, greater than said first operating potential, across said latch circuit following the transfer of data to said latch circuit.

4,216,391
CIRCUIT ARRANGEMENT FOR GENERATING A BINARY-CODED PULSE TRAIN

Wilfried W. Gehrig, Freiburg, and Joachim Grosse, Breisach-Gündlingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 955,835
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758012
Int. Cl.² H03K 1/12; G08B 9/00
U.S. Cl. 307—265 4 Claims



1. A circuit for generating a pulse train having a predetermined first pulse spacing (a) and a second pulse spacing (b) differing from the first by an integral factor greater than one, which pulse spacings are assigned to the binary ZERO and the binary ONE, respectively, dependent upon a predetermined n-bit binary word, comprising:

an (n+1)-stage shift register, said register holding the binary word in the n first stages;

a NOR gate having a first input connected to a serial output of said shift register and an output connected to a shift-signal input of said shift register;

a first inverter stage whose input is fed with a pulse train having a period (T) which is large compared to a pulse width (t) of the pulse train and practically equal to the first pulse spacing (a), and whose output is connected to a second input of said NOR gate;

a second inverter stage having an input connected to the serial output of said shift register; and

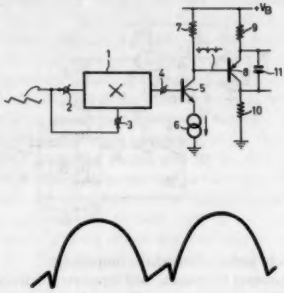
a delay stage whose delay is equal to the second pulse spacing (b), and whose input is connected to an output of said second inverter stage and an output connected to a parallel input of the (n+1)th stage of said shift register.

4,216,392
CIRCUIT FOR PRODUCING A PERIODIC PARABOLIC SIGNAL

Leonardus A. A. Valkestijn, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,788
Claims priority, application Netherlands, Apr. 14, 1977, 7704062
Int. Cl.² H03K 4/04
U.S. Cl. 307—268 6 Claims

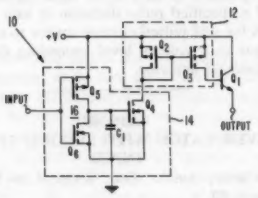
1. A circuit for producing a periodic parabolic signal from a sawtooth-shaped signal, having a trace and a retrace period, with the same frequency, wherein said periodic parabolic signal has a suppressed amplitude during said retrace period, said circuit comprising a squaring stage having an input to which said sawtooth-shaped signal is applied, wherein said squaring stage produces a periodic parabolic signal having an amplitude during the retrace period of said sawtooth-shaped signal which is substantially identical to the amplitude theeof during said retrace period; a transistor amplifier having an input electrode and a first and a second output electrode, said input electrode being coupled to said squaring stage wherein the signal therefrom varies in a blocking sense at the beginning of said trace period; a supply voltage source having a first and a second terminal; a first and a second load, both of said loads being resistive, said first load being coupled between said first output electrode of said transistor amplifier and said first terminal of said supply voltage source and said second load being coupled between said second output electrode of said transistor amplifier and said second terminal of said supply voltage source; and capacitance means for coupling said first output electrode of said transistor amplifier to said second output electrode thereof, wherein said capacitance means and said first and second loads have correlating values such that the resulting time constant thereof is large relative to the duration of said retrace period and small relative to the duration of said trace period.



4,216,393
DRIVE CIRCUIT FOR CONTROLLING CURRENT OUTPUT RISE AND FALL TIMES

James E. Gillberg, N. Plainfield, and Nicholas Kucharewski, Lebanon, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,603
Int. Cl.² H03F 3/16, 3/193; H03K 1/10
U.S. Cl. 307—270 4 Claims



1. In a drive circuit of the type wherein current is supplied to at least one output terminal and each output terminal is connected to a voltage source through a respective bipolar transistor, the improvement comprising:

a current mirror amplifier having a master path and at least one slave path, each said slave path being connected to drive the base of one bipolar transistor; and

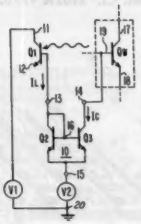
control means for changing the level of current flow through said master path at a predetermined rate wherein said control means includes a first MOS transistor having its drain-source channel connected to selectively supply current flow through said master path and having its gate connected to respond to a control signal through a resistance-capacitance combination by which a time constant is fixed in proportion with said predetermined rate of the current level change in said master path.

4,216,394

LEAKAGE CURRENT COMPENSATION CIRCUIT

Arthur J. Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 26, 1978, Ser. No. 919,068
Int. Cl.[2] H03K *1/02, 1/04*
U.S. Cl. 307—296 R **5 Claims**



1. In an electrical circuit including a workpiece bipolar transistor having first and second electrodes with a reverse-biased semiconductor pn junction therebetween, which workpiece pn junction tends to exhibit a leakage current, leakage current compensating means for diverting said leakage currents to itself and from other portions of said electrical circuit, which leakage current compensating means comprises:

an auxiliary semiconductor pn junction having a similar profile to said workpiece pn junction, having first and second electrodes and being located to be subject to similar thermal conditions as said workpiece pn junction;

potential bias means for establishing a reverse bias potential across said auxiliary junction having a quiescent value substantially the same as that of the reverse bias operating potential across said workpiece pn junction, responsive to which an auxiliary leakage current will tend to flow through said auxillary junction; and

first current mirror means having an input terminal which connects to the first electrode of said auxiliary pn junction for receiving the leakage current flowing through the first electrode of said auxiliary semiconductor pn junction and having at least a first output terminal which connects to the first electrode of said workpiece bipolar transistor, said current mirror means responsive to the auxiliary leakage current flowing through its input terminal to conduct via its output terminal leakage current flowing through the first electrode of said workpiece bipolar transistor to avoid its being conducted by said other portions of said electrical circuit.

4,216,395

DETECTOR CIRCUITRY

David Beecham, Coopersburg, and Jack Kane, Bethlehem, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 16, 1978, Ser. No. 869,845
Int. Cl.[2] H03K *5/18, 3/286, 3/353;* **G11C** *8/00*
U.S. Cl. 307—350 **4 Claims**

1. Detector circuit means which is adapted to detect the logic state of a signal applied to the input terminal thereof and to provide at a first output terminal thereof a signal having the same logic state as is applied to the input terminal and to provide at a second output terminal thereof a signal which is of the opposite logic state comprising:

first, second, third, fourth, fifth and sixth field effect transistors **T1**, **T2**, **T3**, **T4**, **T5**, and **T6**, respectively, each of which comprises a gate terminal and first and second output terminals and has a channel having a preselected width and length;

voltage equalization circuit means;

the gate terminals of **T1** and **T2** being coupled together to the second output terminals of **T4** and **T6**, the second output terminal of **T2** being coupled to the control terminal of **T5** and to the voltage equalization circuit means;

the gate terminals of **T3** and **T4** being coupled to the second output terminals of **T1** and **T5**, the second output terminal of **T3** being coupled to the voltage equalization circuit means and to the gate terminal of **T6**;

the first output terminals of **T5** and **T6** being coupled together;

the lengths of the channels of **T1** and **T2** are greater than the lengths of the channels of **T3** and **T4** such that the threshold voltages of **T1** and **T2** are significantly greater than the threshold voltages of **T3** and **T4**;

a seventh switching device **T20** having a control terminal and first and second output terminals with the second terminal thereof being coupled to the gate terminals of **T3** and **T4**;

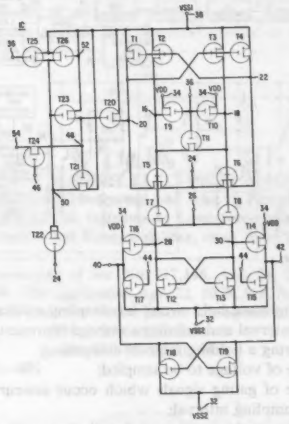
eighth and ninth switching devices **T7** and **T8**, respectively, each of which comprises a control terminal and first and second output terminals;

the first output terminals of **T7** and **T8** being coupled together;

the control terminals of **T5** and **T7** being coupled together;

the control terminals of **T6** and **T8** being coupled together;

tenth, eleventh, twelfth, thirteenth, fourteenth, fifteenth, sixteenth, and seventeenth switching devices **T12**, **T13**,



T14, **T15**, **T16**, **T17**, **T18**, and **T19**, respectively, each of which comprises a control terminal and first and second output terminals;

the control terminal of **T13** being coupled to the second output terminal of **T7**, the first output terminal of **T12**, and to the control terminal of **T16**;

the control terminal of **T12** being coupled to the second output terminal of **T8**, the first output terminal of **T13**, and to the control terminal of **T14**;

the second output terminal of **T14** being coupled to the first output terminals of **T15** and **T19**, to the control terminal of **T18** and to a terminal which is adapted to serve as a first detector circuit means output terminal;

the second output terminal of **T16** being coupled to the first output terminals of **T17** and **T18**, to the control terminal of **T19**, and to another terminal which is adapted to serve as a second detector circuit means output terminal;

capacitive circuit means having first and second terminals;

eighteenth, nineteenth, twentieth, and twenty-first switching devices **T21**, **T23**, **T25**, and **T26**, respectively, each of which comprises a control terminal and first and second output terminals;

first circuit means for selectively allowing an input signal applied to a first terminal thereof, which serves as a detec-

tor circuit means input terminal, to be coupled therethrough to a second terminal thereof which is coupled to the control terminal of the seventh switching device T20 and to the control terminal of T21 and to the first output terminal of T23; and

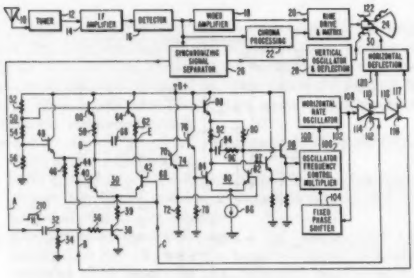
the second output terminals of T21, T25, and T26 being coupled together to the control terminal of T23 and to the second terminal of the capacitive circuit means.

4,216,396

SAMPLE-HOLD PHASE DETECTOR

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,408
Int. Cl.[2] G11C *27/02*
U.S. Cl. 307—353 **6 Claims**



1. A sample-and-hold circuit for sampling a voltage during a sampling interval and holding a voltage representative of the sample during a holding interval comprising:

a source of voltage to be sampled;

a source of gating signals which occur concurrently with said sampling interval;

first and second transistors each including emitter, collector, and base, said first and second transistors being coupled together at their emitters and having their bases coupled to the source of voltage to be sampled;

gated current means coupled to said emitters of said first and second transistors and responsive to said gating signals for supplying operating current to said emitters during said sampling interval;

capacitance means coupled between the collectors of said first and second transistors for storing said voltage representative of said sample during said holding interval;

first and second resistors; and

first and second rectifier means serially coupled with said first and second resistors, respectively, to form first and second series circuits, said first and second series circuits being coupled between a source of potential and the collectors of said first and second transistors, respectively, said rectifier means being biased for supplying current to said collectors during said sampling interval,

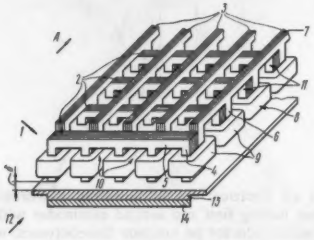
wherein said voltage stored by said capacitance means causes one of said rectifier means to be biased for nonconduction during said holding interval so as to prevent the dissipation of said stored voltage through said first and second series circuits.

4,216,397

LINEAR INDUCTION MOTOR

Alexandr D. Popov, pereulok Rynochny, 44; Vladimir A. Solomin, ulitsa Dachnaya, 14, kv. 31; Sergei S. Khantimirov, pereulok Boevoi, 4, and Alexandr A. Shirikov, ulitsa Petrashevskogo, 48, kv. 23, all of, Rostov-na-Donu, U.S.S.R.

Filed Nov. 21, 1978, Ser. No. 962,782
Claims priority, application U.S.S.R., Mar. 20, 1978, 2591263
Int. Cl.[2] H02K *41/02*
U.S. Cl. 310—13 **1 Claim**



1. A linear induction motor comprising:

an inductor;

a magnetic circuit of said inductor;

said magnetic circuit including laminated cores of a first group, positioned in a perpendicular relation to the direction of movement of said inductor, each of said laminated cores of said first group having a yoke, a plurality of legs interconnected by said yoke, and n slots;

said magnetic circuit including laminated cores of a second group, positioned along the direction of movement of said inductor, each of said laminated cores of said second group having a yoke, a plurality of legs interconnected by said yoke, and a plurality of slots;

said laminated cores of said first group, interconnected by said laminated cores of said second group;

said laminated cores of said first group having heights that are less than the heights of said laminated cores of said second group by at least the height of the yoke of any of the laminated core of the second group;

one of the endmost ones of said laminated cores of said first group having its legs maintained in an abutting relation to all of the endmost legs of the laminated cores of the second group, which are juxtaposed to these legs, the legs of the remaining laminated cores of the first group being disposed in the slots of the laminated cores of the second group and being maintained in an abutting relation to corresponding legs of the laminated cores of said second group;

a multiphase concentrated winding of said inductor;

coils of said multiphase concentrated winding, positioned in rows, each of said coils being adapted to encompass only one leg of the legs of a respective laminated core of said second group and only one of the legs of a respective laminated core of the second group;

a secondary element with respect to which said inductor is displaced;

a magnetically conductive base of said secondary element;

an electrically conductive member of said secondary element, disposed on said magnetically conductive base.

4,216,398
ARRANGEMENT FOR COOLING AN ELECTRIC MACHINE

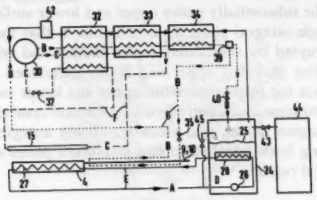
Dieter Kullmann, Langenzenn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 30, 1975, Ser. No. 627,215

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1974, 2453182

Int. Cl.² H02K 9/00

U.S. Cl. 310—53 **7 Claims**



1. In an arrangement for cooling an electric machine such as a turbo generator which has a rotor with a superconducting excitation winding to be cooled to a low temperature, a cooled damping winding concentrically surrounding said rotor excitation winding with the excitation winding coupled to cooled current and supply discharge lines, the improvement comprising:

(a) a first, separate cooling loop for only the rotor excitation winding, containing a cooling medium therein;

(b) a second cooling loop supplying only the current supply and discharge lines;

(c) a third cooling loop for the damping winding;

(d) a cryostat having a low temperature bath containing a coolant;

(e) the cooling medium in said first cooling loop being a cryogenic medium and said cooling loop including a heat exchanger disposed in said low temperature bath; and

(f) at least a portion of evaporated coolant from said low temperature bath being used for supplying at least one of said second and third cooling loops.

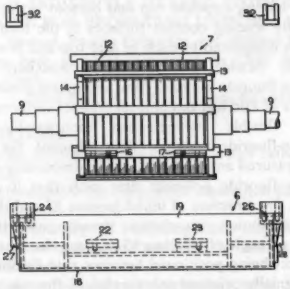
4,216,399
DYNAMOELECTRIC MACHINE SUPPORT FRAME

Robert G. Bartheld, and Paul Diamant, both of Cincinnati, Ohio, assignors to Siemens-Allis, Inc., Atlanta, Ga.

Continuation of Ser. No. 768,687, Feb. 14, 1977, abandoned, which is a continuation of Ser. No. 595,630, Jul. 14, 1975, abandoned. This application Aug. 21, 1978, Ser. No. 935,170

Int. Cl.² H02K 5/00

U.S. Cl. 310—91 **1 Claim**



1. In a dynamoelectric machine having a stator (7) with spaced mounting pads (16, 17) provided with downwardly facing horizontal support surfaces and a rotor supported in bearings mounted in brackets (27, 28) for rotation therein about a horizontal axis with a predetermined uniform air gap (11) between said rotor and stator, said brackets having spaced planar downwardly facing horizontal support surfaces, a frame for supporting said stator and rotor comprising: an elongated horizontal base plate member (18) extending parallel to said axis of said rotor and having laterally spaced upstanding side walls (19, 21) on opposite sides of said rotor, said frame having a first pair (24) and a second pair (26) of planar, horizontal rotor bearing bracket mounting surfaces adjacent opposite ends of said base plate having all points thereon in a common horizontal plans, said planar bearing bracket mounting surfaces of each said pair being laterally spaced on opposite sides of said rotor axis and being adapted to engage said planar support surfaces on one of said brackets, said frame also having portions rigidly connected to the interior facing sides of said side walls providing a first pair (22) and a second pair (23) of planar horizontal stator mounting surfaces spaced apart longitudinally of said base plate member and disposed intermediate said first and second pair of rotor bearing bracket mounting surfaces and having all points thereon in a common horizontal plane and being adapted to directly engage said planar support surfaces on said stator mounting pads, all said rotor bearing bracket mounting surfaces and stator mounting surfaces on the same lateral side of said base plate member being axially aligned with one another in a direction parallel to said rotor axis.

4,216,400
PERMANENT MAGNET ELECTRICAL MACHINES

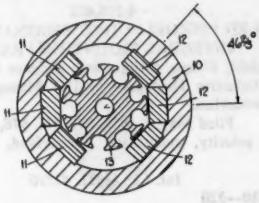
Ronald Lynch, Hemel Hempstead, and John H. Purcell, Dunstable, both of England, assignors to Lucas Industries Limited, United Kingdom and Kane, Dalsimer, et al, New York, N.Y. 10017

Continuation-in-part of Ser. No. 717,146, Aug. 24, 1976, Pat. No. 4,091,300. This application Apr. 21, 1978, Ser. No. 898,951

The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.

Int. Cl.² H02K 21/28

U.S. Cl. 310—154 **2 Claims**



1. A permanent magnet electrical machine comprising:

a. a housing of magnetic material;

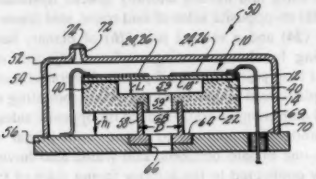
b. an armature rotatably supported in the housing and incorporating a rotor having teeth and windings on said rotor; and

c. two groups of magnets in the housing and magnetically coupled thereby, each magnet of each group having flat spaced parallel pole faces, the magnets of each group being arranged side by side with pole faces of the same polarity innermost and spaced around the armature axis at an agnle different from the angular pitch of the teeth of the rotor, said angle defined by the expression $360/n(1\pm1/2M)$, where n is the number of teeth on the rotor and M is the number of magnets in each group.

4,216,401
SURFACE ACOUSTIC WAVE (SAW) PRESSURE SENSOR STRUCTURE

Robert A. Wagner, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1978, Ser. No. 972,541
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—313 R 1 Claim



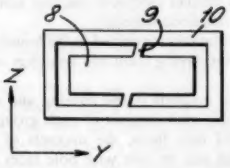
1. An improved SAW pressure sensor structure of the type which includes a SAW pressure sensor having a deformable diaphragm formed in a substrate thereof, a vacuum sealing enclosure adapted to receive the SAW sensor in a vacuum environment, and a cylindrical metal sleeve for supporting the SAW sensor within the vacuum enclosure, the sleevehaving a central aperture for providing fluid communication between the SAW sensor diaphragm and an orifice provided in the wall of the vacuum enclosure, wherein the improvement comprises:

a SAW pressure sensor having dual piezoelectric substrates including a SAW substrate having electro-acoustic transducers disposed in an active signal region on a first one of two parallel major surfaces thereof and including a base substrate bonded in crystallographic orientation to said SAW substrate with a glass seal formed between a second one of said parallel major surfaces and a mating surface of said base substrate, said base substrate having an aperture extending therethrough between said mating surface and a base surface thereof, said aperture having a major diameter opening at said mating surface which is coextensive with said active signal region and having a minor diameter opening at said base surface which is less than one half that of said major diameter, said base surface further including a circular groove circumscribing said aperture minor diameter opening and adapted for bonding to one end of the metal sleeve with a glass seal formed between mutually matching surfaces of each.

4,216,402
SEALED PIEZOELECTRIC RESONATOR WITH INTEGRAL MOUNTING FRAME

Jean Engdahl, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services, S.A., Switzerland

Filed May 9, 1975, Ser. No. 576,173
Claims priority, application Switzerland, May 14, 1974, 6556/74
Int. Cl.[2] H01L *41/10*
U.S. Cl. 310—320 2 Claims



1. A piezoelectric resonator assembly comprising:

a single integral plate being cut to form a peripheral-region means for supporting said resonator assembly; a central resonating region means for resonating in the longitudinal mode, surface-shear mode or bending mode; and at least two oppositely positioned arm means for fastening the peripheral-region means to the central resonating region means at opposite points on the central resonating region means;

said arm means being positioned at nodal zones of said central resonating region means;

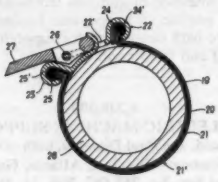
there being a single gap between said peripheral region and said central resonating region at substantially all positions about said central resonating region except at the positions of the arms;

wherein the substantially entire upper and lower surfaces of said single integral plate are continuous in that they are uninterrupted by substantial angles therein and wherein are further included upper and lower metallized plates formed on the respective entire upper and lower surfaces thereof to form excitation electrodes for said central resonating region means, said electrodes being energized by energizing leads attached to said metallized plates at said peripheral region.

4,216,403
MONOAXIALLY ORIENTED PIEZOELECTRIC POLYMER TRANSDUCER FOR MEASUREMENT OF MECHANICAL VALUES ON BODIES

Peter Krempl, Vienna; Peter Claassen, and Helmut List, both of Graz, all of Austria, assignors to Hans List, Graz, Austria

Filed Jul. 25, 1978, Ser. No. 927,844
Claims priority, application Austria, Jul. 27, 1977, 5505/77
Int. Cl.[2] H01L *41/18, 41/10*
U.S. Cl. 310—328 9 Claims



1. A transducer for measuring mechanical values of hollow bodies, especially the pressure distribution within pipes, said transducer including a piezoelectric sensor element in the form of a flexible monoaxially-oriented polyvinylidene-fluoride polymer film having opposite top and bottom surfaces; separate electrically leading contact surfaces in the form of thin metallic layers connected to each of said top and bottom surfaces of said flexible piezoelectric monoaxially-oriented polyvinylidene-fluoride polymer film; and means positioned to encompass one of said top and bottom contact surfaces so as to locate said flexible piezoelectric monoaxially-oriented polyvinylidene-fluoride polymer film adjacent the hollow body to be measured and to stretch said monoaxially-oriented polyvinylidene-fluoride polymer film such that it is under initial tension, the direction of initial tension X' and the direction X of the maximum piezoelectric stretch sensitivity of the film enclosing an angle of less than 45 degrees, the other of said contact surfaces being positioned between said flexible piezoelectric monoaxially-oriented polyvinylidene-fluoride polymer film and the hollow body from which measurements are to be taken.

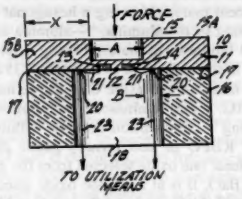
4,216,404
HOUSING AND LEAD ARRANGEMENTS FOR ELECTROMECHANICAL TRANSDUCERS

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Alpine, both of N.J., assignors to Kulite Semiconductor Products Inc., Ridgefield, N.J.

Continuation of Ser. No. 926,839, Jul. 21, 1978, abandoned, which is a continuation of Ser. No. 749,692, Dec. 13, 1976, abandoned. This application Apr. 12, 1979, Ser. No. 29,296

Int. Cl.² H01L *41/10*

U.S. Cl. 310—338 **10 Claims**



1. An electromechanical transducer comprising:

(a) a semiconductor diaphragm member having a "U" shaped cross section with a central area between the upstanding arms of said "U" defining an active area for deflection upon application of a force thereto, said upstanding arms forming a peripheral flange about said central area, with the height of said arms being five to ten times greater than the width of said active area whereby upon application of a force to said diaphragm member, said upstanding arms will not deflect,

(b) at least one piezoresistive element secured to said member within said central area and located on a surface opposite to that containing said peripheral flange,

(c) a longitudinal tubular housing fabricated from glass having a central aperture of a larger diameter than said central area of said diaphragm member and an outer diameter relatively equal to that of said member, said housing secured to said member at said surface containing said element, wherein a portion of the surface of said member underlying said upstanding arms is exposed, with said portion as underlying said arms being relatively insensitive to deflection upon application of said force,

(d) terminal means located on said opposite surface of said member within said exposed portion, said means coupled to said element within said active area, and

(e) conductor means coupled to said terminal means on said exposed area and directed within said central aperture of said housing.

4,216,405
LARGE, INDIRECTLY HEATED, OXIDE-COATED CATHODE FOR PRODUCING UNIFORM PLASMAS

Reiner L. Stenzel, Pacific Palisades, and William F. Daley, Los Angeles, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Aug. 25, 1977, Ser. No. 827,657

Int. Cl.² H01J *1/02*

U.S. Cl. 313—310 **12 Claims**

1. A large, indirectly heated, oxide-coated cathode structure comprising:

(a) a substantially flat cathode of substantial size having one oxide-coated surface;

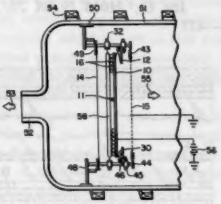
(b) a first plurality of insulating tubes disposed parallel to each other and in contact with the uncoated surface of said cathode;

(c) at least one heater wire extending through each of said insulating tubes for heating at will said cathode to a predetermined temperature;

(d) a second plurality of insulating tubes secured in substantially fixed position and disposed substantially at right angles to said first plurality and in contact therewith;

(e) means for pressing the periphery of said cathode against said first plurality of tubes thereby to maintain said cathode substantially flat in spite of thermal expansion thereof; and

(f) an annular ring spaced from and surrounding the periphery of said cathode, said ring serving as a support for said last-mentioned means.



4,216,406
ELECTRIC LAMP WHEREIN THE TERMINAL SOCKET CAP CONTAINS A FOAMED CAP CEMENT WHICH FUNCTIONS TO PREVENT EXPLOSIONS AND/OR BURNING A HOLE THROUGH THE CAP

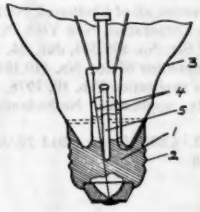
Karl A. G. Björkman, and Günther Jönsson, both of Karlskrona, Sweden, assignors to Lumalampan Aktiebolag, Stockholm, Sweden

Division of Ser. No. 772,596, Feb. 28, 1977, abandoned. This application Sep. 8, 1978, Ser. No. 940,583

Claims priority, application Sweden, Feb. 27, 1976, 7602609

Int. Cl.² H01K *1/20*

U.S. Cl. 313—315 **11 Claims**



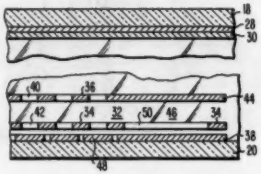
1. In an improved electric lamp comprising a transparent bulb sealed in a terminal socket cap with a foamed cap cement which substantially fills the interior of said terminal cap, said terminal cap having two external contacts and contact wires descending from said bulb through said foamed cap cement in electric contact with respective of said external contacts,

the improvement comprising said foamed cap cement containing in admixture therewith a halogen-containing compound selected from the group consisting of (i) metal halides in an amount between about 2 and 4% by weight of said cement, and (ii) polytetrafluoroethylene in an amount up to 1% by weight of said cement, sufficient to extinguish an electric arc that may be generated within said socket cap.

4,216,407
FLAT PANEL DISPLAY DEVICE WITH BEAM COLLECTOR

Frank E. Vaccaro, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 1, 1978, Ser. No. 956,663
Int. Cl.[2] H01J 29/08, 29/56
U.S. Cl. 313—422 13 Claims

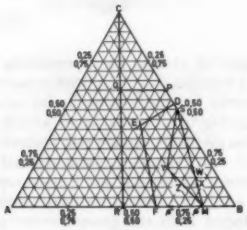


1. A display device comprising:
an evacuated envelope,
a phosphor screen within said envelope,
a plurality of guide means, each comprising a pair of elongated guide grids disposed substantially parallel to said screen for focusing and guiding a plurality of electron beams in paths lying in a beam path plane substantially parallel to said screen and including a plurality of extraction electrodes for deflecting said beams out of said plane and onto said screen to scan a raster on said screen,
means at one end of said guide means for generating and directing said electron beams along said paths, and
electron beam collector means disposed at the other end of said guide means, said collector means comprising a beam collecting pad substantially parallel to and spaced from said screen on the side of said plane opposite said screen, and shielding means extending from said guide means between said screen and said pad, said shielding means being substantially coextensive with said pad.

4,216,408
LUMINESCENT MATERIAL AND DISCHARGE LAMP AND CATHODE RAY TUBE CONTAINING THE SAME

Judicus M. P. J. Verstegen; Johannus G. Verlijsdonk; Emiel P. J. de Meester; Willebrordus H. M. M. van de Spijker, and Johannes G. Verriet, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 699,344, Jun. 24, 1976, abandoned, which is a continuation of Ser. No. 410,184, Oct. 26, 1973, abandoned. This application Feb. 10, 1978, Ser. No. 876,826
Claims priority, application Netherlands, Nov. 3, 1972, 7214862
Int. Cl.[2] C09K 11/46; H01J 29/20, 1/63
U.S. Cl. 313—468 21 Claims



1. A luminescent material having a hexagonal crystal structure corresponding to β-alumina, β"—alumina or the hexagonal ferrites, said luminescent material being activated by bivalent europium in the amount of from about 0.5 at.% to about 25 at.% of the metal of the oxide A in the ternary phase diagram ABC in FIG. 1, said luminescent material being a ternary compound having a composition coming within the sides of the quadrangle RBPQ in said ternary phase diagram ABC wherein A is at least one oxide selected from the group consisting of SrO and BaO, B is selected from the group consisting of Al_2O_3 and a mixture of Al_2O_3 and Ga_2O_3 with at least 75 mol % of B being Al_2O_3 and C is at least one oxide selected from the group consisting of ZnO and MgO, the content of A being about 0.04 to about 0.35, the content of B being about 0.43 to about 0.85 and the content of C being about 0.075 to about 0.36.

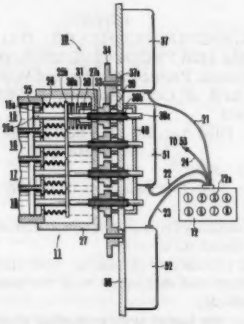
7. A luminescent material having a hexagonal crystal structure corresponding to β—alumina, "—alumina or the hexagonal ferrites, said luminescent material being activated by bivalent manganese in the amount of from about 0.35 at.% to about 8.3 at.% of the metal of the oxide C of the ternary phase diagram ABC in FIG. 1, said luminescent material being a ternary compound having a composition coming within the sides of the quadrangle RBPQ in said ternary phase diagram ABC wherein A is at least one oxide selected from the group consisting of SrO and BaO, B is at least one oxide selected from the group consisting of Al_2O_3 and Ga_2O_3 and C is MgO, the content of A being about 0.09 to about 0.20, the content of B being about 0.60 to 0.82 and the content of C being about 0.05 to about 0.20.

11. A luminescent material having a hexagonal crystal structure corresponding to β—alumina, β"-alumina or the hexagonal ferrites, said luminescent material being activated by a mixture of bivalent europium in the amount of from about 3.1 at.% to about 75 at.% of the metal of the oxide A and bivalent manganese in the amount of from about 4 at.% to about 50 at.% of the metal of the oxide C of the ternary phase diagram ABC in FIG. 1, said luminescent material being a ternary compound a composition coming within the sides of the quadrangle RBPQ in said ternary phase diagram ABC wherein A is at least one oxide selected from the group consisting of SrO and BaO, B is selected from the group consisting of Al_2O_3 and mixtures of Al_2O_3 and Ga_2O_3 with at least 75 mol % of B being Al_2O_3 and C is MgO, the content of A being about 0.04 to about 0.20, the content of B being about 0.60 to about 0.82 and the content of C being about 0.05 to about 0.35.

4,216,409
MULTI-CAVITY KLYSTRON DEVICE

Hisaaki Sato; Morio Shintani; Takayoshi Shinozaki; Takuichi Tsuchiya, and Toshio Asai, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1978, Ser. No. 962,715
Claims priority, application Japan, Nov. 25, 1977, 52-141932
Int. Cl.[2] H01J 25/10
U.S. Cl. 315—5.46 9 Claims



1. A multi-cavity klystron device using a klystron of the type which includes an electron gun for generating an electron

beam, a collector means for collecting the electron beam, and a high frequency circuit having a plurality of cavity resonators for making the electron beam interact with input micro waves, comprising a preset device and a tuning mechanism controlled by said preset device, said tuning mechanism including a plurality of movable elements, each of which is installed in each of said cavities for varying the resonant frequency of the cavity with each of said elements having a predetermined position within said cavity for each of certain predetermined klystron channel frequencies, a pulse motor associated each of said movable elements, and means for driving each of said movable elements in response to the rotation of said associated pulse motor, said preset device comprising a plurality of memory unit means for storing a set of values for each of said predetermined klystron channel frequencies, each of said sets of values comprising a preset value associated with each of said movable elements which corresponds to said predetermined position of said movable element for said corresponding predetermined klystron channel frequency with said memory unit means also including energizing means responsive to said preset values for providing pulsed voltage to each of said pulse motors for a selected one of said klystron channel frequencies so as to drive said pulse motors and said movable elements associated with said pulse motors until said elements are at said predetermined positions which correspond to said selected klystron channel frequency;

whereby said klystron is tuned to said selected klystron channel frequency.

4,216,410

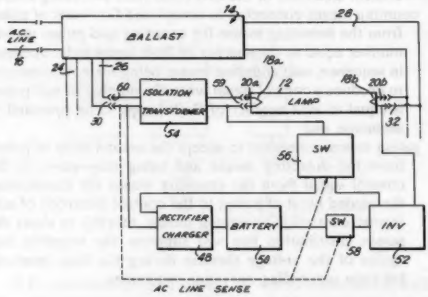
EMERGENCY LIGHTING SYSTEM

Robert S. Feldstein, 1396 Park La., Pelham Manor, N.Y. 10803

Filed Nov. 16, 1977, Ser. No. 851,900

Int. Cl.[2] H02J *9/06, 7/00;* **H05B** *41/14*

U.S. Cl. 315—86 **11 Claims**



1. A fixture mountable system for energizing an internally ballasted lamp of the type designed to operate when said fixture is connected to an AC line, said lamp illuminating when an operating potential is applied to first and second terminals on said lamp by corresponding first and second terminals on said fixture to produce an operating current through said lamp, said system including battery terminal means for connection to a rechargeable battery for providing emergency illumination power to said system when said AC line is deenergized, said system comprising:

battery charge means having a pair of input terminals and a pair of output terminals, one of said input terminals of said charge means being operatively connected to said first fixture terminal, and the other one of said input terminals of said charge means being operatively connected to said first lamp terminal when said AC line is energized, said pair of charge means output terminals being operatively connected to respective terminals on said battery, said battery charge means including a rectifier circuit arranged to pass said lamp operating current between said charge means input terminals and to develop a DC charge voltage for charging said battery by rectifying said lamp operating current;

inverter circuit means having an input terminal operatively connected to said battery when said AC line is deenergized, a first output terminal operatively connected to said first lamp terminal when said AC line is deenergized, and a second output terminal operatively connected to said second lamp terminal, said inverter circuit means developing an AC output potential corresponding to said lamp operating potential for illuminating said lamp when said AC line is deenergized;

first switch means for operatively connecting said first lamp terminal to either of said other input terminal of said charge means when said AC line is energized and said first output terminal of said inverter circuit means when said AC line is deenergized;

second switch means for operatively connecting said input terminal of said inverter circuit means to said battery when said AC line is deenergized; and

means for mounting said system in combination with said lamp and said battery in said fixture, said mounting means including a housing for containing said system and said lamp and said battery when operatively connected to one another, said housing having connector means extending therefrom for operatively connecting said system to said fixture terminals when said housing is mounted in said fixture;

whereby said battery charge means is coupled in series with said lamp operating current developed when said AC line is energized and said battery is thereby charged, and said inverter circuit means is coupled to said lamp to illuminate said lamp by power developed from said battery when said AC line is deenergized.

4,216,411

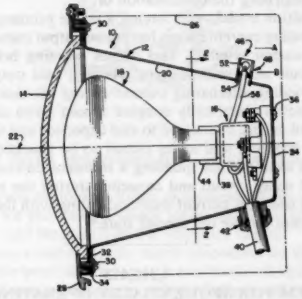
UNDERWATER LIGHT ASSEMBLY WITH LOW-WATER CUT-OFF

Gordon F. Ehret, Alhambra; William N. Rowley, Palos Verdes Est., and Hermenegildo Espiritu, Cerritos, all of Calif., assignors to Wylain, Inc., Dallas, Tex.

Filed Aug. 8, 1978, Ser. No. 931,872

Int. Cl.[2] H05B *37/02*

U.S. Cl. 315—118 **8 Claims**



1. A liquid-cooled wet-niche lamp structure for providing underwater illumination in water-containing pools or the like and protected against over-temperature operation, said lamp structure comprising:

a lamp housing adapted to receive an illuminable lamp therein;

said lamp housing adapted to be supported in a heat exchange relationship with a surrounding liquid cooling media and having a power circuit for connecting a source of electrical power to the lamp;

a thermally responsive sensor having a negative temperature coefficient for detecting the presence or absence of the liquid cooling media; and

control circuit means connected to said sensor to interrupt the flow of electrical power to the lamp in the absence of the liquid cooling media and to resume the flow of electrical power to the lamp in the presence of the liquid cooling media, said control circuit means adapted to provide a flow of electrical current through said thermally responsive sensor to effect selfheating thereof and including a semi-conductor switch connected to said sensor and said power circuit, said sensor, when normally cooled by the liquid cooling media, maintaining said semi-conductor switch in a conductive state to provide a flow of electrical current to the lamp, and said sensor, in the absence of the liquid cooling media, causing said semi-conductor switch to switch to a non-conductive state to interrupt the flow of electrical current to the lamp, said thermally responsive sensor and said control circuit means electrically insulated from said liquid cooling media.

4,216,412

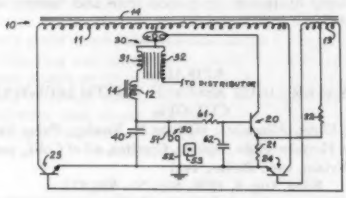
TRANSIENT MODULATED AC IGNITION SYSTEM

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 812,912, Jul. 5, 1977, and a continuation-in-part of Ser. No. 814,457, Jul. 11, 1977, and a continuation-in-part of Ser. No. 868,118, Jan. 9, 1978, and a continuation-in-part of Ser. No. 878,792, Feb. 17, 1978, and a continuation-in-part of Ser. No. 913,437, Jun. 7, 1978. This application Jul. 12, 1978, Ser. No. 923,828

Int. Cl.[2] H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—209 T **6 Claims**



1. A system for energizing at least one igniter of a fuel burning engine, said system having first and second states of operation, comprising the combination of:

an ignition transformer having a single primary winding;

alternating current means having an output transformer with an output winding, said output winding being in series circuit with said primary winding, said output winding providing alternating current during the second state;

a capacitor electrically coupled to said series circuit; and

control means, connected to said capacitor and series circuit, for enabling said series circuit to be charged during the first state and for enabling a transient current to flow in said series circuit and capacitor during the second state, said transient current intermodulating with the alternating current during the second state.

4,216,413

SYSTEM FOR SEQUENTIALLY OPERATING FLASH LAMPS IN REPEATED SEQUENCES

Jean J. Plas, Wezembeek-Oppem, Belgium, assignor to Societe Anonyme des Etablissements Adrien De Backer, Brussels, Belgium

Filed Apr. 2, 1979, Ser. No. 26,349

Claims priority, application Belgium, Mar. 13, 1979, 193984

Int. Cl.[2] H05B *41/34;* **G08G** *5/00*

U.S. Cl. 315—323 **3 Claims**

1. A control system for operating a plurality of flash lamps in repeated sequences, comprising:

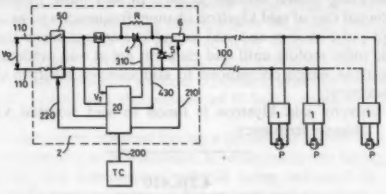
a power distribution line to which each of the plurality of flash lamps is connected through an individual trigger circuit,

a control unit having input terminals connected across an alternating current power source and output terminals connected to the power distribution line, the control unit comprising:

first controlled switching means connected in series between the input and the output terminals for transmitting a positive half cycle of the power source voltage each time it is gated by a pulse being applied to its control electrode, said pulse corresponding to a triggering command for a respective flash lamp,

second controlled switching means connected across the output terminals thereby to short circuit the power distribution line each time it is gated by a pulse being applied to its control electrode,

means connected across the power source voltage for detecting the half cycles of the power source voltage and producing a first burst of pulses in which each pulse corresponds to a positive half cycle of the power voltage and a second burst of pulses in which each pulse corresponds to a negative half cycle of the power source voltage, the pulses of said first burst of pulses being applied to the control electrode of the first controlled switching means,



counting means connected to accept said first burst of pulses from the detecting means for counting said pulses up to a number equal to the number of flash lamps to be operated in sequence, said counting means being further connected to produce a control signal when the number of said pulses is equal to said number of flash lamps to be operated in sequence, and

gating means connected to accept the second burst of pulses from the detecting means and being responsive to the control signal from the counting means for transferring the second burst of pulses to the control electrode of said second controlled switching means, thereby to short the power distribution line and suppress the negative half cycles of the voltage thereon during the time intervals between succeeding operation sequences.

4,216,414

ISOLATION TRANSFORMER FOR A MAGNETIC DEFLECTION YOKE

Glenn C. Waehner, Riverside, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1978, Ser. No. 972,549

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—405 **8 Claims**

1. A driver circuit for use with a magnetic deflection yoke of a CRT, said magnetic deflection yoke having at least two windings which may include some parasitic capacitance therebetween, comprising:

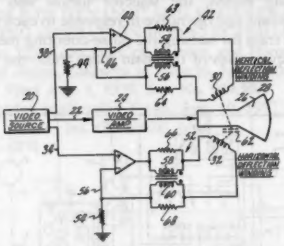
operational amplifier means having an input for receiving a deflection signal, and including an output for presenting an amplified signal waveform to one side of one winding of said magnetic deflection yoke;

sense resistor means connected to the other side of said one winding for coupling said deflection signal waveforms to ground;

a feedback means for presenting the signal waveform across

said sense resistor means to said input of said operational amplifier; and

means for introducing an impedance in series with said parasitic capacitance which, at high frequency, acts as a high impedance, whereby the effective resonant frequency of said yoke is changed enhancing the overall bandwidth of said driver circuit and reducing the depth of the null associated with said resonance.



4,216,415

POSITION CONTROL SYSTEM COMPRISING A DIGITAL ALGEBRAIC ADDER CIRCUIT

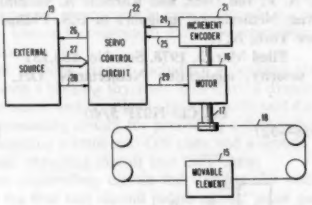
Shigeru Shimonou, and Hiroshi Inada, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed May 31, 1978, Ser. No. 911,263

Claims priority, application Japan, May 31, 1977, 52-64310; Jun. 1, 1977, 52-65079; Jun. 1, 1977, 52-65083; Jun. 3, 1977, 52-65947; Feb. 17, 1978, 53-17810

Int. Cl.[2] G05B *19/26*

U.S. Cl. 318—600 **12 Claims**



1. In a position control system for use in combination with a movable element, a motor rotatable with a variable angular velocity to controllably vary a current position of said element, and a command signal generator for producing a command signal indicative of a commanded position of said element, said angular velocity having either of two senses of rotation at a time, said system comprising an increment encoder to be coupled to said motor to produce a pair of polarity variable incremental position signals and servo control means responsive to said command and said position signals for supplying a motor drive signal to said motor to make said motor move said element eventually to said commanded position, said position signals varying their respective polarities with a phase difference therebetween in response to every predetermined incremental angle of rotation of said motor, each of said position signals thereby varying its polarity at a rate dependent on a current angular velocity of said motor, said phase difference being representative of the sense of said current angular velocity, the improvement wherein said servo control means comprises:

position pulse producing means responsive to said incremental position signals for producing position pulses representative of an angular position of said motor and said current angular velocity;

mode signal producing means responsive to said command signal and said position pulses for producing a mode signal during an interval of time during which said current position is within a predetermined distance from said commanded position;

control signal producing means responsive to said command signal, said position pulses, and said mode signal for producing a control signal representative of a digital control datum, said control datum giving a position error between said current and said commanded positions during presence of said mode signal and otherwise giving at least one reference angular velocity;

gate pulse producing means responsive to said position pulses for producing gate pulses of a predetermined pulse width at a time at a rate dependent on said current angular velocity;

digital adder means responsive to a reference signal respresentative of a digital reference feedback value at a time, said gate pulses, said position pulses, and said control signal for calculating during presence of each of said gate pulses an algebraic sum of said reference feedback value and said control datum to produce a digital signal, said algebraic sum being one of an arithmetic sum and a difference that is determined by that sense of said current angular velocity with which said each gate pulse is related, said digital signal being representative of the algebraic sums and the control data during presense and absense, respectively, of said gate pulses; and

a driving signal producing circuit responsive to said digital signal for producing said motor drive signal.

4,216,416

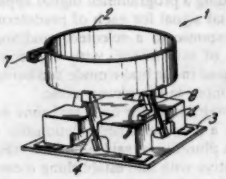
ELECTRONIC VIBRATORY FEED BOWL DRIVER

James W. Grace, Cromwell, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed Oct. 2, 1978, Ser. No. 947,783

Int. Cl.[2] B65G *27/32, 43/08*; H02K *33/00*

U.S. Cl. 318—128 **3 Claims**



1. Driver circuit arrangement for a vibratory feeder comprising:

sensor means responsive to the movements of the vibratory feeder for providing a sensor signal indicative of the amplitude and frequency of the vibratory feeder;

a frequency control circuit means responsive to the sensor signal for providing a constant amplitude triangular wave signal having a frequency substantially equal to the frequency of vibration of the vibratory feeder;

a trigger point circuit means responsive to the triangular wave signal for providing a trigger pulse occuring substantially at a predetermined oscillation point of the vibratory feeder;

a detector means responsive to the sensor signal for providing a width control signal indicative of variation from a predetermined amplitude of the vibratory feeder; and

a variable pulse width generator means responsive to said trigger pulse and said width control signal for providing a variable width drive current pulse(s) to the vibratory feeder having a frequency substantially corresponding to

the frequency of said vibratory feeder and occuring substantially at the predetermined oscillation point and having a width for maintaining the amplitude of the vibratory feeder substantially at the predetermined amplitude.

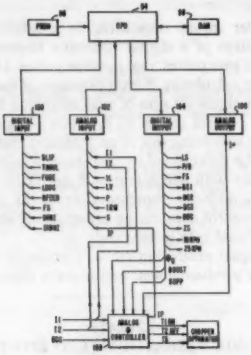
4,216,417
TRANSIT VEHICLE MOTOR OPERATION CONTROL APPARATUS AND METHOD

Larry W. Anderson, Pittsburgh; James H. Franz, Jr., Murrysville, and Thomas C. Matty, North Huntingdon Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 709,686, Jul. 29, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,345

Int. Cl.[2] H02P *1/00, 3/00, 7/00*

U.S. Cl. 318—274 **12 Claims**



1. In control apparatus for a chopper operative with a transit vehicle electric motor for determining the operation of said electric motor in one of a power mode and a brake mode, the combination of:

means including a programmed digital apparatus for providing a digital signal for each of predetermined time intervals in response to a selected condition related to the operation of said motor, with said condition being the vehicle speed in the brake mode and being the phase angle of the chopper in the power mode;

means for establishing for each said time interval when the signal has a predetermined relationship with a provided limit for a plurality of said time intervals;

means operative with said establishing means for controlling the operation of said electric motor; and

means for supplying to the digital signal providing means said selected condition for each said time interval.

4,216,418
SPEED REGULATION OF D.C. MOTOR USING COUNTER

Eduard Wagensonner, Aschheim, and Istvan Cocron, Munich, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

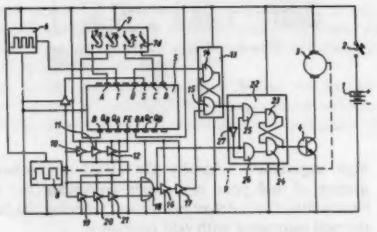
Filed May 10, 1978, Ser. No. 904,559

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722041

Int. Cl.[3] H02P *5/16*

U.S. Cl. 318—318 **12 Claims**

1. A motor-speed control for use with a D.C. motor, comprising semiconductor switch means connected in the current path of the D.C. motor and having a conductive and a non-conductive state; pulse-generating means operative for generating a main pulse train of higher pulse repetition frequency and a set pulse train of lower repetition frequency, and including means for varying the frequency of one of the pulse trains in dependence upon the rotary speed of the motor; pulse-counting means having a counting input connected to the pulse-counting means and operative for selecting a motor speed by selecting a number of pulses which the pulse-counting means is to count; counter-control means connected to the pulse-counting means, the selector means and the pulse-generating means and operative in response to each set pulse of the set pulse train for causing the pulse-counting means to start counting anew pulses of the main pulse train, the number of



pulses counted by the pulse counting means during each such counting of pulses reaching or failing to reach the selected number of depending on whether the motor speed is too low or too high; and storage means having only two states and connected to the pulse-counting means and responding to the reaching of the selected number by keeping the semiconductor means in one state and responding to failure to reach the selected number by keeping the semiconductor switch means in the other state.

4,216,419
TACHOMETER SYSTEM

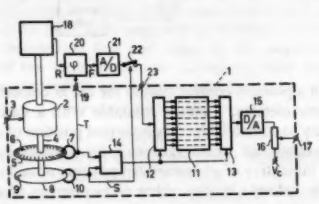
Rudolf A. A. F. van Dam, and Kornelis A. Immink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1978, Ser. No. 883,131

Claims priority, application Netherlands, Oct. 24, 1977, 7711634

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—327 **12 Claims**



1. A tachometer system for supplying a control signal indicative of positional and/or speed errors of a rotatable element comprising, a tachometer coupled to the rotatable element, the tachometer having a plurality of marks arranged in a closed track, a detector responsive to said marks for supplying n tacho-pulses per revolution of the rotatable element, and a correction circuit for supplying n correction signals in synchronism with the tacho-pulses so as to compensate for control-signal deviations caused by positional errors of the marks, the correction circuit comprising, a memory device with n memory locations, a write system for storing n phase error signals in said n memory locations in synchronism with the tacho-pulses, the phase error signals being obtained by phase comparison of the tacho-pulses with a reference signal while the tachometer is driven at approximately a constant speed,

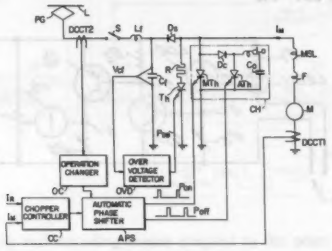
and a read system for reading said n phase error signals from the memory device in synchronism with the tacho-pulses so as to obtain the n correction signals.

4,216,420

BRAKING CONTROL SYSTEM SELECTIVELY OPERABLE IN DYNAMIC AND REGENERATIVE BRAKING OPERATION FOR ELECTRIC CAR

Yoshiji Jinbo; Eiji Kozu, both of Katsuta, and Hiroshi Narita, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 1, 1978, Ser. No. 929,956
Claims priority, application Japan, Aug. 10, 1977, 52-95179
Int. Cl.[2] H02P *3/14*
U.S. Cl. 318—370 **4 Claims**



1. A braking control system selectively operable in dynamic braking and regenerative braking operation for an electric car comprising:

a d.c. motor for driving the electric car;

a chopping circuit connected in parallel with said d.c. motor to control a current flowing through said d.c. motor operated as a generator during braking operation;

a diode connected between said d.c. motor and a d.c. source so as to permit the current to flow from said d.c. motor to the d.c. source therethrough during regenerative braking operation;

a dynamic braking circuit including a braking resistor in series with a braking thyristor fired during dynamic braking operation, and coupled in parallel with said d.c. motor;

a pulse generating circuit for providing a first pulse to turn said chopping circuit into ON state and a second pulse to turn said chopping circuit into OFF state;

a chopper controlling circuit for varying the interval between the first and second pulses of said pulse generating circuit to adjust ON time and OFF time of said chopping circuit in response to the current of said d.c. motor;

a change responsive means for controlling said pulse generating circuit to extend the ON time of said chopping circuit to a predetermined period of time enough to quench the braking thyristor when the braking operation of said d.c. motor is changed from the dynamic braking operation to the regenerative braking operation.

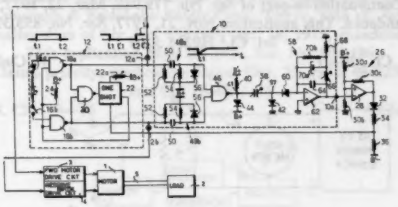
4,216,421

APPARATUS AND METHOD FOR THE THERMAL SIMULATION OF A CONSTANT LOAD ELECTRIC MOTOR

Jean Dupont, Paris, France, assignor to Compagnie Internationale pour l'Informatique, Paris, France

Filed Aug. 10, 1978, Ser. No. 932,634
Claims priority, application France, Aug. 19, 1977, 77 25415
Int. Cl.[2] H02P *3/00*
U.S. Cl. 318—471 **18 Claims**

1. Apparatus for the thermal simulation of a constant load electric motor responsive to a command source which supplies command pulses to the motor so the motor operates at a given speed of rotation with predetermined starting and stopping periods, said apparatus being responsive to each of the command pulses to generate a DC voltage for the thermal simulation of the motor and comprising a capacitive means, means responsive to each of the command pulses for changing the charge on the capacitive means so the charge change is proportional to (1) the square of the rotation speed, and (2) the reciprocal of at least one of the starting and stopping periods, and means responsive to the charge change as a function of the intrinsic electrical, thermal and mechanical characteristics of the motor for deriving a DC voltage for thermal simulation of the motor.

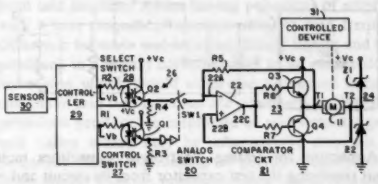


4,216,422

SOLID STATE MOTOR CONTROL CIRCUIT PROVIDING A DYNAMIC BRAKING FUNCTION

August A. Divjak, Waukesha, and Peter Miczek, Milwaukee, both of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Feb. 15, 1979, Ser. No. 12,282
Int. Cl.[2] G05B *5/01*
U.S. Cl. 318—612 **10 Claims**



1. A motor control circuit for controlling the energization of a motor to effect selective bidirectional rotation of a shaft of the motor in response to command signals supplied to the control circuit, said control circuit comprising:

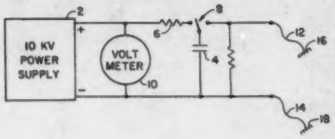
input means responsive to each command signal to generate a control signal of a sense indicative of the desired direction of rotation of the shaft;

comparator circuit means having a first input coupled to an output of said input means and to a first terminal of the motor, a second input coupled to a second terminal of the motor, and an output coupled to one of said terminals of the motor, said comparator circuit means responding to each control signal to provide a potential of selected polarity between terminals of the motor, thereby energizing the motor; said comparator circuit means being effective upon removal of said control signal from its first input to deenergize the motor and effectively interconnect said motor terminals, whereupon the motor generates a back emf, and said comparator circuit responding to said back emf to equalize the potentials at said motor terminals.

4,216,423
APPARATUS AND METHOD FOR ENHANCING ELECTRICAL CONDUCTIVITY OF CONDUCTIVE COMPOSITES AND PRODUCTS THEREOF

Donald E. Davenport, Palo Alto, Calif., assignor to MB Associates, San Ramon, Calif.

Continuation-in-part of Ser. No. 779,986, Mar. 22, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,393
Int. Cl.[2] H02M 3/04
U.S. Cl. 320—1 11 Claims



8. A system for increasing the conductivity of a conductive resinous composite material containing at least 5% electrically conductive additives by volume dispersed throughout the composite material comprising

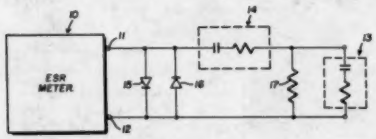
a unitary article consisting of said conductive resinous composite material and

means for discharging at least one short high voltage pulse through at least a portion of said article, said pulse having a discharge time constant of 10 microseconds or less, whereby current paths among said conductive additives are increased in number and enhanced.

4,216,424
METHOD AND APPARATUS FOR TESTING ELECTROLYTIC CAPACITORS

Carl W. Vette, 1417 N. Selfridge, Clawson, Mich. 48017

Filed Oct. 30, 1978, Ser. No. 955,989
Int. Cl.[2] G01R 27/02, 27/26
U.S. Cl. 324—62 7 Claims



4. Apparatus for testing electrolytic capacitors incircuit without removing the test capacitor from its circuit and without first discharging said test capacitor comprising:

AC ohmmeter means having a test output and a test input for measuring the equivalent series resistance of said test capacitor, said test capacitor being operatively coupled in a series path between said test output and said test input of said AC ohmmeter means for measuring the ESR of said electrolytic capacitor being tested;

a blocking capacitor having a low capacitive reactance X_c and a relatively low ESR relative to the electrolytic capacitor under test operatively coupled in series between one input of said AC ohmmeter means and said test capacitor for blocking any steady state DC voltage to permit in-circuit testing;

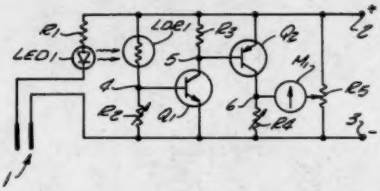
said AC ohmmeter means including graduated scale means for providing a visual indication of said measured ESR; and

said AC ohmmeter means further including peak detector means having an operational amplifier, a pair of oppositely poled peak detecting diodes connected between the output of said amplifier and one input thereof, and a supplemental feedback resistor coupled in parallel with said pair of diodes between the output of said amplifier and said input for providing a relatively large amount of negative feedback for reducing the phase lift at the output of said operational amplifier to a low enough level to permit the peak detector diodes to operate in a conventional peak-detecting manner.

4,216,425
APPARATUS AND METHOD FOR DETECTING A SUBSTANCE IN A FLUID MEDIUM

Richard M. Tompkins, 3193 Herbell Dr., Pontiac, Mich. 48054, and Jerome L. Graham, 413 Starkweather, Plymouth, Mich. 48170

Continuation of Ser. No. 476,714, Jun. 5, 1974, abandoned. This application Apr. 4, 1977, Ser. No. 784,180
Int. Cl.[2] G01N 27/42
U.S. Cl. 324—443 6 Claims



1. An electronic apparatus for substantially instantaneously detecting the quantity of a predetermined substance disposed in a fluid medium, comprising, in combination:

first means for contacting said fluid medium and for sensing an electrical condition of said fluid medium caused at least in part by said predetermined substance to the detected, said first means including a probe for sensing a change in the resistance of said fluid medium;

second means operatively and electrically connected to said first means for generating substantially instantaneously at least one signal which is substantially proportional to said quantity of said predetermined substance disposed in said fluid medium, said second means including a light emitting diode connected in series with said probe;

third means operatively and electrically connected to said second means for utilizing substantially instantaneously said signal which is substantially proportional to said quantity of said predetermined substance disposed in said fluid medium, said third means including a meter calibrated to read substantially instantaneously the amount of the predetermined substance to be detected;

and said probe, by sensing a change in the resistance of said fluid medium, acts as a variable resistance in series with said light emitting diode, thereby varying its light output which in turn substantially instantaneously controls the indication on said meter, said indication being proportional to the amount of the predetermined substance disposed in said fluid medium.

4,216,426
SELF-CLOCKED DATA TRANSMISSION SYSTEM HAVING AUTOMATIC SIGNAL REVERSING MEANS

Laurence P. Flora, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 16,976, Mar. 2, 1979, abandoned. This application Jun. 5, 1979, Ser. No. 45,806
Int. Cl.[2] H04L 3/00
U.S. Cl. 455—28 9 Claims

1. In a digital data transmission system, the improvement comprising:

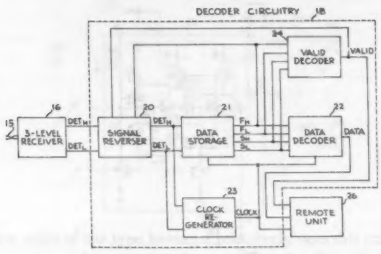
encoding means responsive to an applied clock signal and to an applied valid signal for encoding input binary signals into a three-level signal having first and second levels and an intermediate level with level transitions occurring at

times determined by said clock signal and with encoding being performed in response to the presence of said valid signal;

said encoding means including means responsive to said valid signal for inserting a predetermined start signal at the beginning of the three-level signal provided in response to input binary signals applied along with a valid signal;

a two-wire transmission line;

driving means for coupling said three-level signal to one end of said transmission line for transmission thereby;



receiving and decoding means coupled to the other end of said transmission line for receiving the transmitted three-level signal, deriving said clock and valid signals therefrom, and employing the derived clock signal for decoding the received three-level signal into binary form;

said receiving and decoding means including signal reversing means responsive to the derived valid signal and start signal occurring at the beginning of a received three-level signal for automatically reversing the three-level signals received from said two-wire transmission line.

4,216,427

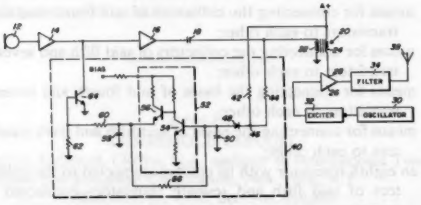
ADAPTIVE AUDIO COMPRESSOR

Charles W. Bethards, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 670,505, Mar. 25, 1976, Pat. No. 4,110,699. This application Jun. 14, 1978, Ser. No. 915,485

Int. Cl.[2] H04B *1/04*; H03B *3/02*

U.S. Cl. 455—119 **6 Claims**



1. In an AM transmitter wherein an audio signal modulates an RF carrier, and wherein the percent modulation of the RF carrier is a function of a DC supply voltage, the improvement comprising:

a means for sensing the level of the DC supply voltage, and means for sensing the audio signal level and adjusting the audio level in response to both the sensed DC supply voltage and sensed audio signal level to maintain a substantially constant percent modulation level and the percent modulation within a given maximum limit, wherein the ratio of the audio signal level to the DC supply voltage level is maintained at a substantially constant level despite variations in the DC supply voltage level.

4,216,428

PULSE SIGNAL RECEIVING SYSTEM EMPLOYING SPACE DIVERSITY

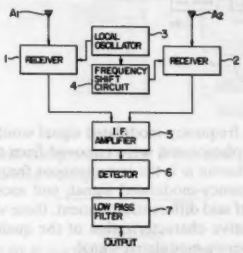
Yoshinobu Tatsuzawa, Yokohama; Masayuki Sakamoto, Yokosuka, and Hiromi Wasai, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Nippon Telegraph & Telephone Public Corp., Tokyo, both of, Japan

Continuation of Ser. No. 626,097, Oct. 28, 1975, abandoned. This application May 15, 1978, Ser. No. 906,196

Claims priority, application Japan, Oct. 29, 1974, 49-125017

Int. Cl.[2] H04B *1/16*

U.S. Cl. 375—75 **4 Claims**



1. A system for receiving a high frequency carrier signal modulated by a modulating signal comprising:

at least two antennas spaced from each other for receiving said high frequency modulated carrier signal,

local oscillator means for generating two different local oscillating signals, the frequency difference between said local oscillating signals being not less than the fundamental frequency of said modulating signal,

two receivers respectively coupled to said antennas and to said local oscillator means for generating respective intermediate frequency signals, and

amplifier means coupled to said receivers for combining said intermediate frequency signals, the resultant output signal from said amplifier means having pulsations of amplitude with a beat frequency corresponding to said frequency difference between said local oscillating signals and being produced in a region corresponding to an amplitude valley region which would otherwise be caused when the outputs of said two antennas are combined, such that said pulsations produce an amplitude of said output signal in said valley which may be subsequently detected, said frequency difference causing the period of said pulsations to be smaller than the minimum signal width contained in said modulating signal, and

detector means to detect said resultant output signal to produce a demodulated signal.

4,216,429

METHOD AND APPARATUS FOR QUANTITATIVELY MEASURING THE RECEPTION QUALITY OF A RECEIVED FREQUENCY-MODULATED ULTRASHORT-WAVE SIGNAL

Theodor T. Bossert, Munich, Fed. Rep. of Germany, assignor to Richard Hirschmann, Radiotechnisches Werk, Esslingen am Neckar, Fed. Rep. of Germany

Filed Apr. 10, 1979, Ser. No. 28,809

Int. Cl.[2] H04B *1/36, 17/00*

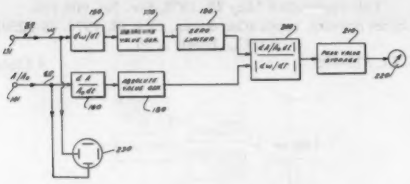
U.S. Cl. 455—148 **13 Claims**

1. A method of quantitatively measuring the reception quality of a frequency-modulated ultrashort-wave signal where the frequency signal exhibits amplitude modulation resulting from wave-reflection phenomena, comprising: measuring the instantaneous frequency deviation of the frequency modulated ultrashort-wave signal; measuring the amplitude of the frequency modulated ultrashort-wave signal; deriving from said mea-

sured amplitude and frequency deviation a differential-quotient measurement

$$\partial A/A_o \partial \omega,$$

wherein A corresponds to the amplitude of the frequency-modulated signal, wherein A_o corresponds to the amplitude



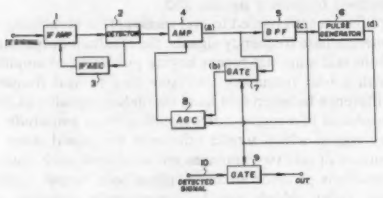
value which the frequency-modulated signal would have if the wave-reflection phenomena were removed from the reception situation, and wherein ω is the instantaneous frequency deviation of the frequency-modulated signal; and ascertaining the extreme values of said differential quotient, these values constituting a quantitative characterization of the quality of reception of the frequency-modulated signal.

4,216,430

NOISE ELIMINATING CIRCUIT WITH AUTOMATIC GAIN CONTROL

Kiyoshi Amazawa; Masaharu Mori, and Takashi Taniyama, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,277
Claims priority, application Japan, Feb. 21, 1978, 53-18768
Int. Cl.[2] H04B 1/10
U.S. Cl. 455—219 **3 Claims**



1. A noise eliminating circuit for a radio receiver having noise eliminating gate means comprising:

detector means for detecting an audio signal from an incoming signal thereto;

amplifier means for amplifying an output of said detector means corresponding to said audio signal;

noise detector means for extracting a noise signal from the output of said amplifier means;

signal producing means for providing a gate control signal to said noise eliminating gate means in response to said noise signal;

automatic gain control means for controlling the gain of said amplifier means;

AGC control gate means adapted to switch from an on-state to an off-state in response to said gate control signal, said said AGC control gate means applying the output of said amplifier means to said automatic gain control means during the on-state;

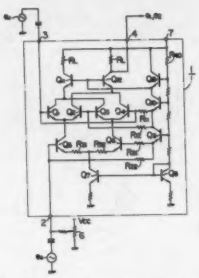
said automatic gain control means providing noise gain control of said amplifier means in response to said noise signal from said noise detector means and providing audio gain control of said amplifier means in response to said output of said amplifier means applied through said AGC control gate means.

4,216,431

INTEGRATED CIRCUIT FOR FREQUENCY CONVERSION

Akira Shibata, Katsuta, and Yoshizumi Watatani, Yokohama, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 7, 1978, Ser. No. 940,368
Claims priority, application Japan, Sep. 9, 1977, 52-107795
Int. Cl.[2] H04B 1/26
U.S. Cl. 455—333 **5 Claims**



1. A frequency converter circuit for receiving a carrier signal and a signal to be frequency-converted and delivering out the frequency-converted signal with a minimized leakage of the carrier, comprising:

a first transistor of grounded emitter connection as a constant current source;

second and third transistors with their emitters each connected to the collector of said first transistor through a resistor;

fourth and fifth transistors with their emitters connected in common and connected to the collector of said second transistor;

sixth and seventh transistors with their emitters connected in common and connected to the collector of said third transistor;

means for connecting the collectors of said fourth and sixth transistors to each other;

means for connecting the collectors of said fifth and seventh transistors to each other;

means for connecting the bases of said fourth and seventh transistors to each other;

means for connecting the bases of said fifth and sixth transistors to each other;

an eighth transistor with its emitter connected to the collectors of said fifth and seventh transistors connected in common;

a load connected to the collector of said eighth transistor;

a first signal applying terminal connected to one of the bases of said second and third transistors;

a second signal applying terminal connected either to the bases of said fourth and seventh transistors connected in common or to the bases of said fifth and sixth transistors connected to each other;

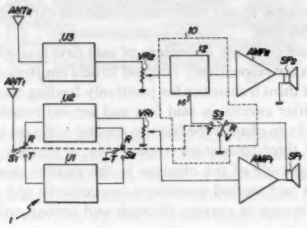
means for applying said signal to be frequency-converted to one of said first and second signal applying terminals and said carrier signal to the other of the said and second signal applying terminals; and

an output terminal connected to the collector of said eighth transistor.

4,216,432
AUTOMATIC SWITCHING SYSTEM FOR A COMBINATION TRANSCEIVER-AUXILLIARY RECEIVER RADIO

Kazuyoshi Imazeki, and Koichi Kazami, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

Filed Sep. 8, 1977, Ser. No. 831,421
Int. Cl.[2] H04B *1/40, 1/44*
U.S. Cl. 455—79 **2 Claims**



1. In a radio of the type having a selectively operable transmitter portion and an associated receiver portion for two-way communication, plus an auxiliary receiver for reproducing auxiliary audio signals, said auxiliary receiver including a tuning section and an audio amplifier section, said tuning section having its output coupled to the input of said audio amplifier section, a system for automatically interrupting the audio signal output of said auxiliary receiver whenever said transmitter portion is operated, said system comprising: first switch means coupled to said transmitter portion and associated receiver portion for enabling selective activation of said transmitter portion and associated receiver portion; auxiliary switch means comprising an electronic circuit coupled between said first switch means and said auxiliary receiver, said electronic circuit comprising a switching transistor having its emitter-collector junction coupled in parallel with the input of said audio amplifier section, said switching transistor having its base coupled to said first switch means and responsive to said first switch being operated to activated said transmitter portion for by-passing signals applied to the input of said audio amplifier section from said tuner section, whereby actuation of the switching transistor interrupts the audio reproduction by said auxiliary receiver to prevent the transmitted signal from including the auxiliary audio signal.

4,216,433
THRESHOLD CIRCUIT

Jesse S. LeGrand, Clifton, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 13, 1978, Ser. No. 869,391
Int. Cl.[2] H03D *3/00*; H03K *17/12*
U.S. Cl. 328—111 **15 Claims**

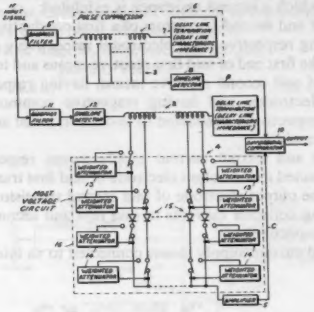
1. A threshold circuit for a long coded pulse having a given amplitude subdivided into a plurality of chips each providing a code bit comprising:

an input for said coded pulse;

first means coupled to said input to compress said coded pulse into a short pulse of much greater amplitude than said given amplitude and to detect said compressed pulse;

second means coupled to said input to detect said coded pulse and to provide an amplitude threshold voltage; and

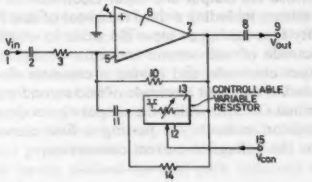
third means coupled to said first and second means to produce a binary "1" output when the amplitude of said compressed pulse is greater than the amplitude of said threshold voltage and a binary "0" output when the amplitude of said compressed pulse is less than the amplitude of said threshold voltage.



4,216,434
VARIABLE GAIN ALTERNATING VOLTAGE AMPLIFIER

Jürgen Wermuth, Stederdorf, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 880,206, Feb. 22, 1978, abandoned.
This application May 18, 1978, Ser. No. 40,213
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1977, 2707609
Int. Cl.[2] H03G *3/00*
U.S. Cl. 330—86 **11 Claims**



1. In a variable gain alternating voltage amplifier having a d.c. negative feedback loop connected between the output and input of the amplifier for setting the operating point of the amplifier, the improvement wherein a variable resistance feedback loop is connected directly in parallel with said d.c. feedback loop for effecting a change in gain in said amplifier, said variable resistance feedback loop including the series connection of an electronically controllable resistor and a capacitor with one terminal of said capacitor being connected to said input of said amplifier and with one terminal of said controllable resistor being directly connected to said output of said amplifier.

4,216,435
VOLTAGE-TO-CURRENT CONVERTER APPARATUS

Adel A. A. Ahmed, Clinton Township, Hunterdon County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 25, 1979, Ser. No. 6,877
Int. Cl.[2] H03F *3/45, 3/04*
U.S. Cl. 330—254 **9 Claims**

1. A voltage-to-current converter comprising:

terminals IN and IN for receiving therebetween the voltage to be converted to a current;

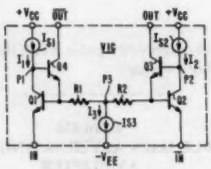
first resistive means having first and second ends between which a first resistance is exhibited;

second resistive means having first and second ends between which a second resistance is exhibited;

first and second transistors of a first conductivity type having respective input electrodes respectively connected to the first end of said first resistive means and to the first end of said second resistive means, having respective output electrodes, and having respective common electrodes respectively connected to said IN terminal and to said IN terminal;

first and second current supply means respectively connected to the output electrode of said first transistor and to the output electrode of said second transistor for supplying collector currents to said first and second transistors respectively;

third current supply means connected to an interconnection



of the second ends of said first and second resistive means for supplying said interconnection a current of opposite polarity to the currents respectively supplied to the output electrodes of said first and second transistors by said first and second current supply means;

first feedback means providing direct coupled feedback between the output and input electrodes of said first transistor;

second feedback means providing direct coupled feedback between the output and input electrodes of said second transistor, including a third transistor of said first conductivity type having an input electrode to which the output electrode of said second transistor connects, having an output electrode, and having a common electrode connected to the input electrode of said second transistor; and

a terminal OUT to which the output electrode of said third transistor connects for passing a first current obtained from the voltage-to-current conversion.

4,216,436

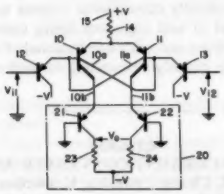
HIGH GAIN DIFFERENTIAL AMPLIFIER

Peter Lefferts, San Martin, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 20, 1978, Ser. No. 917,153

Int. Cl.² H03F *3/45*

U.S. Cl. 330—260 **14 Claims**



1. An amplifier comprising:

first and second composite transistors each having an emitter coupled to a means for biasing, a base, a first collector, and a second collector;

a third transistor having a collector coupled to another means for biasing, an emitter coupled to said base of said first transistor, and a base for receiving input signals;

a fourth transistor having a collector coupled to said another means for biasing, an emitter coupled to said base of said second transistor, and a base for receiving second input signals; and

first resistive means coupled to receive current from said second collector of said first composite transistor, and second resistive means coupled to receive current from said second collector of said second composite transistor for generating a voltage across said resistive means proportional to any difference in current through said second collectors;

wherein said first collectors of said first and second transistors are respectively coupled to said emitters of said fourth and third transistors for positively feeding back changes in emitter current in said first and second transistors respectively to change the base-to-emitter voltages in said fourth and third transistors respectively to thereby increase the magnitude of the changes in the emitter currents in said first and second transistors respectively and amplify said difference in current through said second collectors.

4,216,437

PROTECTIVE CIRCUITRY FOR PUSH-PULL AMPLIFIERS

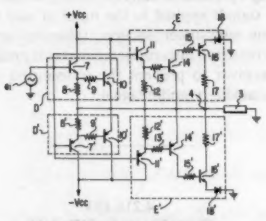
Kaku Sakaida, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 11, 1978, Ser. No. 950,457

Claims priority, application Japan, Oct. 14, 1977, 52/123207; Oct. 20, 1977, 52/126146; Jul. 18, 1978, 53/87278

Int. Cl.² H03F *3/21*

U.S. Cl. 330—298 **12 Claims**



1. Protective circuitry for use with a double power source, single ended, push-pull amplifier having first and second output transistors adapted for operation into a common load impedance at a common output terminal, said protective circuitry comprising

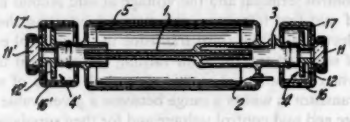
amplifying means including first and second amplifying circuits respectively connected in parallel with said first and second transistors so that the inputs thereof, are respectively connected to the inputs to said first and second transistors and the outputs thereof are also adapted for operation into said common load impedance, said amplifying means including means for rendering the amplifying means operative only when a phase difference occurs between the output voltage and the output current at said common output terminal.

4,216,438

INTERNAL MIRROR TYPE GAS LASER TUBE

Fumio Seki, and Taizo Oikado, both of Nippon Electric Co., Ltd., 33-1, Shiba Gochome, Minato-ku, Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,600
Claims priority, application Japan, Dec. 6, 1976, 51-163723[U]
Int. Cl.² H01S 3/02
U.S. Cl. 331—94.5 D 7 Claims



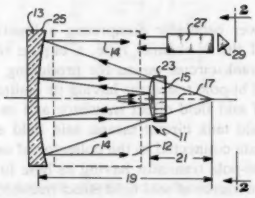
1. An internal mirror type gas laser tube capable of stable output power comprising, an envelope for a laser medium, anode and cathode electrodes, a pair of metallic adjustment members fixed at opposite ends of said envelope, each member having at least two fins, a pair of mirrors respectively fixed to the pair of metallic adjustment members, an insulating covering member covering the exposed outside surface of at least one of said metallic adjustment members, and means for mechanically fixing said covering member to a limited portion of a predetermined one of the fins of said one metallic adjustment member so as to retain spacing between said one fin and the other of said fins.

4,216,439

APPARATUS FOR ACCOMPLISHING SPECTRAL LINE SELECTION IN LASERS BY RETROREFLECTIVE FEEDBACK

Charles R. Pond, Federal Way, and Richard B. Hall, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 8, 1978, Ser. No. 903,762
Int. Cl.² H01S 3/08
U.S. Cl. 331—94.5 C 6 Claims



1. An apparatus for locking the spectral output of a laser which includes a laser resonator to selected spectral lines, comprising,

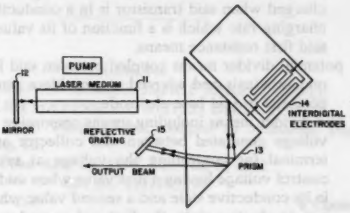
multi-line diffraction grating means formed in one mirror of the laser resonator, positioned so that a propagating laser beam which has made a number of passes along a gain path in the laser resonator impinges thereon, for selecting at least one spectral line from the frequency spectrum of the laser beam and reflecting said one spectral line back into the resonator along the gain path.

4,216,440

SURFACE ACOUSTIC WAVE TUNING FOR LASERS

John P. Rahn, and Richard S. Hughes, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1978, Ser. No. 937,659
Int. Cl.² H01S 3/10
U.S. Cl. 331—94.5 C 11 Claims



1. A tunable laser comprising:

a lasing medium for emitting a beam of coherent electromagnetic radiation along a predetermined path;

means for pumping said lasing medium to cause emission of said coherent beam;

means for totally reflecting said coherent beam placed near said lasing medium in said path for creating one end of a resonant cavity;

a prism with a base and two sides in said path on the other side of said lasing medium than said reflecting means for transmitting said coherent beam through the base and into said prism such that it strikes one of said sides at an angle that produces total internal reflection to said second side where total internal reflection occurs again to produce an output beam from said prism through said base;

a means for producing variable frequency surface acoustic waves in said sides of said prism for making each side of said prism a reflective diffraction grating to said coherent beam in a predetermined manner whereby said coherent beam is divided into a plurality of beams within said prism that has an output with a selected frequency; and

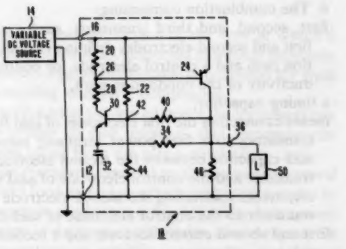
a reflecting grating in the path of said output beam from said prism base positioned to reflect part of said output beam from said prism base so as to create a second end of a resonant cavity defined by said path followed by said coherent beam.

4,216,441

ASTABLE MULTIVIBRATOR CIRCUIT

Finis C. Easter, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,451
Int. Cl.² H03K 3/282
U.S. Cl. 331—111 6 Claims



1. An astable multivibrator of the type in which a transistor

alternately is in a conductive or nonconductive state, comprising in combination:

a transistor having base, emitter and collector electrodes;

a first terminal and a second terminal adapted to receive therebetween a source of direct current potential;

first resistance means providing a predetermined value of resistance coupled to said terminal and said collector electrode;

a capacitor coupled between said emitter electrode and said second terminal, said capacitor being adapted to be charged when said transistor is in a conductive state at a charging rate which is a function of its value and that of said first resistance means;

potential divider means coupled between said first and second terminals and adapted to provide a portion of said potential to said base electrode;

said divider means including means responsive to a control voltage generated between said collector and said first terminal for controlling the voltage at said base, said control voltage having a first value when said transistor is in its conductive state and a second value when it is in its non-conductive state, the first and second values of said control voltage causing, respectively, a first portion of said potential or a second different portion of said potential to be applied to said base electrode, said first portion causing a relatively greater potential difference between said base electrode and said second terminal than the potential difference caused by said second portion;

said control voltage of said first value causing said capacitor to be charged until said transistor becomes non-conductive, and;

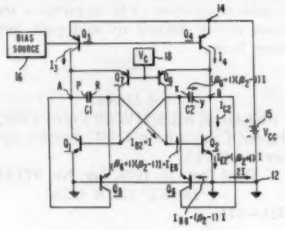
second resistance means providing a resistance coupled in parallel with said capacitor and responsive to said transistor in its non-conductive state for discharging said capacitor to a value at which said transistor becomes conductive.

4,216,442

CONTROL CIRCUIT FOR MULTIVIBRATOR

Carl F. Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1978, Ser. No. 965,110
Int. Cl.[2] H03K *3/282, 3/284*
U.S. Cl. 331—113 R **10 Claims**



6. The combination comprising:

first, second, and third transistors; each transistor having first and second electrodes defining the ends of a conduction path and a control electrode for controlling the conductivity of the conduction path,

a timing capacitor;

means connecting the first electrodes of said first and second transistors to a first power terminal; means connecting said capacitor between the second electrode of said first transistor and the control electrode of said second transistor; means connecting the second electrode of said second transistor to the control electrode of said first transistor;

first and second current sources, and a second power terminal;

means connecting said first and second current sources between the second electrodes of said first and second transistors, respectively, and said second power terminal;

a control terminal for the application thereto of a control voltage; and

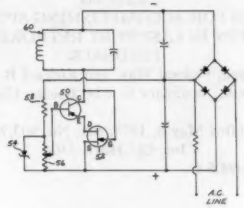
means for controlling the charging period of said capacitor including means connecting the control electrode and the first electrode of said third transistor between said control terminal and the second electrode of said first transistor for sensing the difference between the voltage at said control terminal and the voltage at said second electrode of said first transistor, and means connecting the second electrode of said third transistor to the control electrode of said first transistor for turning on said third transistor when the potential at said second electrode of said first transistor is within a range between a given value of voltage and said control voltage and for then supplying a turn on current to said first transistor and for discontinuing the turn-on of said third transistor when said potential is outside of this range.

4,216,443

TRANSISTOR RESONANT CIRCUIT POWER OSCILLATORS

Andrew Zaderej, South Bend, Ind., assignor to Unitron Corporation, Elkhart, Ind.

Continuation of Ser. No. 879,434, Feb. 21, 1978, abandoned, which is a continuation of Ser. No. 791,283, Apr. 27, 1977, abandoned. This application Feb. 2, 1979, Ser. No. 8,778
Int. Cl.[2] H03B *5/12*
U.S. Cl. 331—115 **2 Claims**

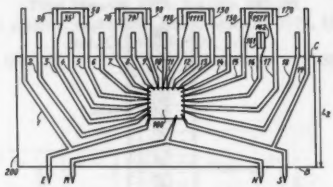


1. A power oscillator comprising a junction field effect transistor of the N-channel type, a bi-pole transistor of the PNP type, tank circuit means for producing a resonant frequency, and bi-pole transistor having its emitter connected to the drain of said field effect transistor and its collector connected to said tank circuit means, said field effect transistor having its gate connected to the collector of said bi-pole transistor, said bi-pole transistor having its base functionally connected to the source of said field effect transistor, diode means for biasing said bi-pole transistor base, said tank circuit means adapted for connection to a power source at its negative part, the source of said field effect transistor adapted for connection to the positive part of said power source, said bi-pole transistor and field effect transistor producing in combination a negative resistance effect with lambda-shaped current-voltage output characteristic, said diode means including a zener diode and resistor in parallel, means for connecting said zener diode and resistor to said power source independently of said field effect transistor and bi-pole transistor, the base of said bi-pole transistor being connected to said resistor.

4,216,444
STEP ADJUSTABLE ATTENUATOR

Claude Vergnolle, and Christian Val, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 14, 1978, Ser. No. 942,195
Claims priority, application France, Sep. 16, 1977, 77 28066
Int. Cl.² H03H 7/26
U.S. Cl. 333—81 R 11 Claims

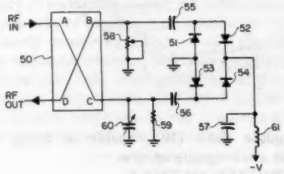


1. A step adjustable attenuator intended to be inserted in surrounding circuits and comprising an integrated circuit formed by a plurality of attenuating sections, said attenuator comprising an insulative substrate, a thin film-network deposited on said substrate and forming said integrated circuit, some of the connections in said integrated circuit being omitted, contact points disposed on the periphery of said substrate and thin-film electrical conductors connecting said network to said contact points; said attenuator further comprising a conductive pattern forming a set of leads having one end respectively bonded to said contact points and other ends arranged in first and second rows of outputs, said first row being provided for connections with said surrounding circuits, said second row comprising a first set of outputs interconnected in twos providing those connections in said integrated circuit omitted in said network and a second set of outputs; said attenuator further comprising displaceable connecting means adaptable to said second set of outputs.

4,216,445
VARIABLE RESISTANCE ATTENUATOR

Anthony Abajian, Ronkonkoma, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 22, 1978, Ser. No. 972,199
Int. Cl.² H01P 1/22
U.S. Cl. 333—81 R 3 Claims



1. A variable resistance attenuator comprising:

quadrature hybrid means having an input port, an output port, and at least first and second other ports, such that radio frequency power applied at the input port divides equally between the first and second other ports, and the output port is isolated;

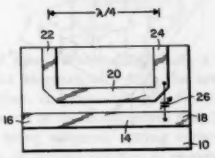
at least four PIN type diodes whose radio-frequency resistance is a function of their direct-current bias coupled to said first and second other ports, with first and second of said diodes in parallel coupled between the first other port and ground, and third and fourth of said diodes in parallel between the second other port and ground, adjustable bias means to supply direct current through said diodes to control the resistance thereof;

and termination impedance means coupled between said first and second other ports and ground, comprising a plurality of impedance elements, including an adjustable resistor coupled to said first other port, and an adjustable capacitor in parallel with a fixed resistor coupled to said second other port, to match the characteristic impedance of the hybrid when the diodes are unbiased.

4,216,446
QUARTER WAVE MICROSTRIP DIRECTIONAL COUPLER HAVING IMPROVED DIRECTIVITY

Herbert W. Iwer, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1978, Ser. No. 937,362
Int. Cl.² H01P 5/18
U.S. Cl. 333—112 4 Claims

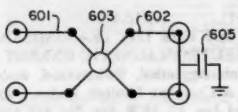


4. In a one-quarter wave length long microstrip directional coupler including a signal line and a coupling element an improvement comprising a discrete capacitor placed adjacent to a directive port of said coupler and connected between the signal line and the coupling element.

4,216,447
HIGH PERFORMANCE FERROMAGNETIC FILTERS APPLICABLE FROM THE VHF THROUGH THE MICROWAVE FREQUENCY RANGES

William J. Keane, and John A. Mezak, both of San Jose, Calif., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 5, 1978, Ser. No. 966,744
Int. Cl.² H03H 7/10
U.S. Cl. 333—207 9 Claims



1. A ferromagnetic resonant device of the type in which a ferromagnetic resonant material, subjected to a static magnetic field, is also subject to a generally circularly polarized RF field produced by a coupling structure, comprising:

(a) a first line with a loop passing adjacent the ferromagnetic material to couple to said material, said ferromagnetic material being offset from the plane of said loop, and

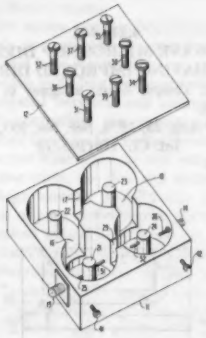
(b) a capacitive reactance coupled to the generally central portion of said loop in region where said loop couples to said ferromagnetic material to aid in adjusting the currents in the segments of the loop on either side of said capacitive reactance coupling to exhibit a generally orthogonal phase relationship.

4,216,448

MICROWAVE DISTRIBUTED-CONSTANT BAND-PASS FILTER COMPRISING PROJECTIONS ADJACENT ON CAPACITIVELY COUPLED RESONATOR RODS TO OPEN ENDS THEREOF

Osamu Kasuga; Satoru Omi, and Tsutomu Kyuzaki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1978, Ser. No. 871,170
Claims priority, application Japan, Jan. 21, 1977, 52/4851
Int. Cl.[2] H01P 1/20, 7/06, 7/04
U.S. Cl. 333—203 9 Claims



1. In a microwave distributed-constant filter of band-pass characteristics having at least one attenuation pole in a finite frequency band, said filter being responsive to an input signal of an input frequency band included in said finite frequency band for producing an output signal in an output frequency band predetermined in said finite frequency band and comprising an input and an output terminal for said input and output signals, two first resonator rods, a second resonator rod, first coupling means for capacitively coupling said first resonator rods direct to each other, second coupling means for inductively coupling said first resonator rods through said second resonator rod, and third coupling means for coupling said first resonator rods to said input and said output terminals, respectively, each of said first and second resonator rods having an open end, a shorted end, and a middle point between said open and said shorted ends, the improvement wherein said first coupling means comprises a projection on each of said first resonator rods between the open end and the middle point of each of the first resonator rods, the said projections being directed to each other.

4,216,449

WAVEGUIDE FOR THE TRANSMISSION OF ELECTROMAGNETIC ENERGY

Alfred Käch, Untersiggenthal, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 12, 1978, Ser. No. 868,840
Claims priority, application Switzerland, Feb. 11, 1977, 1661/77
Int. Cl.[2] H01P 3/06, 3/12
U.S. Cl. 333—236 13 Claims

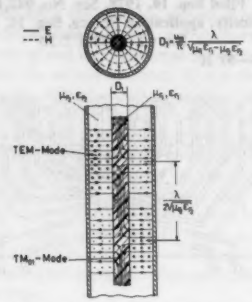
1. A waveguide for the transmission of electromagnetic energy, comprising:

a cylindrical metallic sheath functioning to guide forward electromagnetic waves;

a wire-shaped body disposed coaxially in the interior of said sheath, said sheath and said wire-shaped body defining an intermediate space therebetween;

a medium having a low dielectric constant (ϵ_2) located in the space between said sheath and the wire-like body:

said wire-shaped body consisting solely of a dielectric material exhibiting a high dielectric constant (ϵ_1) such that an E_{om} wave (circular H field) can be excited only in the dielectric wire-shaped body, the dimensioning of the dielectric wire-shaped body being such, depending on the



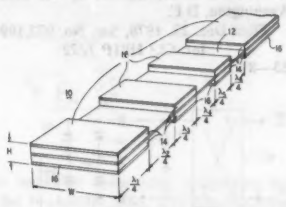
dielectric constants ϵ_2 and ϵ_1, and the particular operating frequency, so that a substantially pure TEM wave can develop at least substantially in the intermediate space.

4,216,450

MILLIMETER WAVEGUIDE SHORTS

Richard A. Linke, and Martin V. Schneider, both of Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 1, 1978, Ser. No. 956,481
Int. Cl.[2] H01P 1/28, 1/24
U.S. Cl. 333—248 16 Claims



1. A waveguide short (10) capable of being slideably mounted within a waveguide section

CHARACTERIZED IN THAT

the waveguide short comprises

a substrate (12) comprising an electrically conductive material and a longitudinal axis;

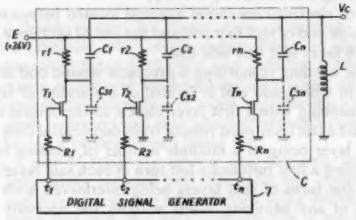
a first layer (14) of a good electrically conductive material disposed in alternate quarter-wavelength sections both normal to the longitudinal axis and on the exposed major surfaces of the substrate adjacent one end thereof, the length of the quarter-wavelength sections being determined from the frequency bands to be supported by the waveguide section and the effective dielectric constant of the material in each quarter-wavelength section; and

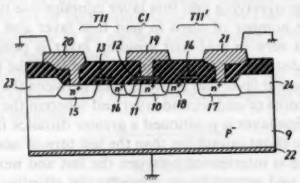
a second layer of an insulating material disposed on the exposed major surface of each of the sections of good electrically conductive material.

4,216,451
VARIABLE CAPACITANCE DEVICE HAVING A PLURALITY OF CAPACITANCE ELEMENTS AND A PLURALITY OF SWITCHING ELEMENTS THEREFOR FORMED ON A SINGLE COMMON SUBSTRATE

Itsuro Nishimura, Takatsuki, and Tsutomu Ohgishi, Yahata, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 10, 1978, Ser. No. 885,281
Claims priority, application Japan, Mar. 10, 1977, 52-27827
Int. Cl.[2] H03J *5/24, 3/18*
U.S. Cl. 334—15 **35 Claims**





33. A variable capacitance device comprising:

a plurality of capacitance elements, each having a predetermined capacitance value and coupled in parallel with each other wherein said plurality of capacitance elements are formed on a single common substrate, each said capacitance element comprising a conductive region formed on one surface of said single common substrate, an insulating layer formed on said conductive region, and an electrode formed on said conductive region with said insulating layer therebetween; and

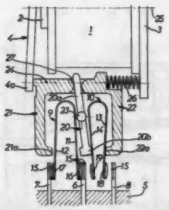
a plurality of switching means, each individually coupled to said plurality of capacitance elements for individually and selectively rendering effective said plurality of capacitance elements wherein each said switching means is an insulated gate field effect transistor having a gate, drain and source, wherein said conductive region of said capacitance element and drain of said insulated gate field effect transistor are electrically connected.

4,216,452
ELECTROMAGNETIC RELAY WITH DOUBLE-BREAKING CONTACTS

Daniel Arnoux, Saint Germain en Laye; Gérard Koehler, Ville d'Avray; Bernard Michel, Conflans Saint Honorine; Claude Genter; Jean Aguettaz, both of Paris, and Alain Berthelot, Saint Germain, all of France, assignors to Societe Chauvin Arnoux, Paris, France

Filed Jun. 23, 1978, Ser. No. 918,503
Claims priority, application France, Jun. 23, 1977, 77 19218
Int. Cl.[2] H01H *67/02, 63/02*
U.S. Cl. 335—128 **9 Claims**

1. An electromagnetic relay comprising an electromagnet, an armature movable between a first position and a second position, first and second contact studs fixed in relation to the electromagnet and having mutually facing inner faces, a first pair of arms consisting of first and second arms tending to move away from each other and having outer faces, respectively, carrying a first and a second electric contact surface electrically interconnected and bearing resiliently, in the first position of said armature, against the inner faces of the first and second contact studs, respectively, said relay also comprising a first movable control member associated kinematically with the armature and adapted, during a movement of said armature towards its second position, to engage the outer face of the first arm for moving the first contact surface away from the first

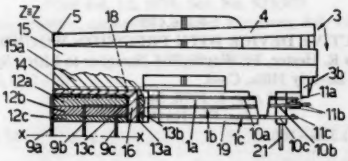


contact stud, said relay further comprising a second control member associated kinematically with the armature and the first control member, and movable in a direction opposed to that of the movement of the first control member, said second control member being adapted, during a movement of said armature towards its second position to engage the outer face of the second arm in order to move the second contact surface away from the second contact stud, the first and second contact surfaces moving towards each other by performing substantially identical and simultaneous movements.

4,216,453
LAMINATED SPRING FOR RELAYS AND THREE-WAY SWITCHES

Carlo De Feo, Arzano, Italy, assignor to Industria Politecnica Meridionale S.p.A., Arzano, Italy

Filed Nov. 17, 1977, Ser. No. 852,377
Claims priority, application Italy, Dec. 22, 1976, 52742 A/76
Int. Cl.[2] H01H *63/02*
U.S. Cl. 335—133 **5 Claims**



1. A contact spring for use in a laminated array forming a transfer relay or the like, the contact spring comprising:

a unitary, elongate spring member fabricated from an elastically deformable conductive metal and having a body portion and a fore portion of approximately equal longitudinal dimension, the fore portion being configured to form a pair of substantially parallel, longitudinally extending arm members having outer side outlines defining a first arm portion that tapers from the body portion and towards the ends of said arms and a second substantially rectilinear portion extending from the tapered portion of said arms, said body portion including an elongate tongue element shaped and configured to form a first longitudinally extending portion and a second portion extending substantially perpendicular from the first portion; and

a pair of contact pads having a substantially semicylindrical shape and a longitudinal flat surface affixed to the rectilin-

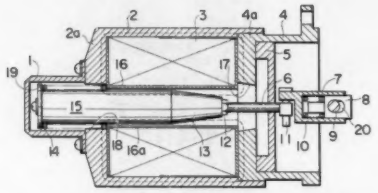
ear portion proximate at least one main surface of each arm.

4,216,454

PLUNGER-TYPE ELECTRO-MAGNETIC ACTUATOR

Yoshio Ohtani, Matsuyama, and Todomu Kakishima, Fukuoka, both of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1978, Ser. No. 930,443
Claims priority, application Japan, Aug. 2, 1977, 52-92161
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—262 **8 Claims**



1. An electro-magnetic actuator of the type having a plunger adapted to drive a member to be controlled, an electromagnetic solenoid having a first and a second magnetic pole pieces and having said plunger slidably inserted therethrough, and a biasing spring for urging said plunger in the direction opposite to said second magnetic pole piece, the position of said plunger being controlled by an exciting current flowing in said electromagnetic solenoid, wherein the improvement comprises:

(a) a tapered tip portion formed along the end portion of said plunger in the direction of said second magnetic pole piece;

(b) a tapered hole formed in said second magnetic pole piece, the minimum diameter of said tapered hole being larger than the maximum diameter of said plunger such that said tip portion passes freely therethrough; and

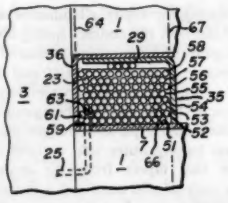
(c) a third magnetic pole piece disposed at the side of said second magnetic pole piece, away from said first magnetic pole piece, said third magnetic pole piece spaced apart from said second magnetic pole piece, said tapered hole of said second magnetic pole piece being covered by said third magnetic pole piece.

4,216,455

INDUCTIVE DEVICE WITH PRECISION WOUND COIL

Thomas E. Hester, Ft. Wayne, Ind., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Apr. 6, 1978, Ser. No. 894,091
Int. Cl.[2] H01F 27/28
U.S. Cl. 336—160 **13 Claims**



1. In a power transformer of the type containing a magnetic iron structure, formed of laminations of magnetic iron material, said structure having a central core leg and first and second outer core legs essentially parallelly extending and on opposite sides of said central core leg and spaced therefrom, first and second yoke legs magnetically joining the ends of said core legs on the right and left sides to define two coil receiving windows, and having first and second magnetic shunt assemblies each formed of magnetic iron material; and containing:

a first winding of electrically insulated wire of a diameter D formed into a first coil and a second winding of electrically insulated wire formed into a second coil, each of said first and second coils each having first and second side ends spaced apart along the axis of the respective coil;

a core insulator covering said central core leg;

said first and second coils mounted in side-by-side relationship over said core insulator on said central core leg;

and said first and second magnetic shunt assemblies sandwiched in between said coils in said first and second coil receiving windows, respectively;

a strip of electrical insulation material located between the first side end of said first coil and the one of said yoke legs which faces said first side end;

said first winding comprising a precision wound coil of the type in which said coil is formed of a plurality of layers commencing with a first layer closest to the central core leg and a last layer most remote from said central core leg, each layer being of a multiple number of winding turns including a first turn and a last turn in each said layer and with the turns of said layers being interleaved with the turns of any adjoining layers without the necessity for additional interlayer electrical insulation;

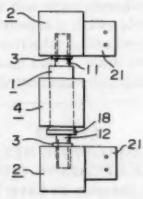
the improvement therein in which in said first coil the second layer overlying said first layer contains one turn more than the number of turns in said first layer and wherein said first turn of said first winding layer is positioned a greater distance from said one yoke leg than the first turn of the second layer and is interleaved between the first and second turns of said second layer and wherein the last turn of said first layer is positioned a greater distance from said magnetic shunt assemblies than the last turn of said second layer and is interleaved between the last and next to last turns of said second layer, whereby the effective spacing between said first coil and said magnetic structure is enhanced.

4,216,456

CURRENT LIMITING APPARATUS

Shigenori Hotta; Sadaaki Baba, and Masaru Takahashi, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 18, 1978, Ser. No. 952,395
Claims priority, application Japan, Jul. 18, 1978, 53-98500[U]
Int. Cl.[2] H01H 37/36, 61/00, 87/00
U.S. Cl. 337—114 **27 Claims**

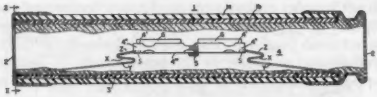


1. In a current limiting apparatus comprising a current limiter housing filled with a current limiting substance whose phase is converted by heat generation caused by overcurrent to produce a high resistance and thus to impart a current limiting function, said apparatus further comprising current terminals connected to each end of said current limiter housing with cooling fins disposed on each current terminal, an improvement which comprises a cooling fin assembly surrounding an outer wall of said current limiter housing filled with said current limiting substance.

4,216,457
ELECTRIC FUSE HAVING FOLDED FUSIBLE ELEMENT AND HEAT DAMS

Robert J. Panaro, Byfield, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Aug. 8, 1978, Ser. No. 932,020
Int. Cl.² H01H 85/04
U.S. Cl. 337—160 13 Claims

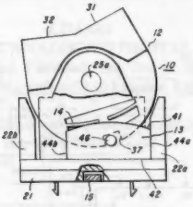


1. A fusible element for electric fuses comprising
(a) a relatively wide center section folded in longitudinal direction, being perforated and defining a plurality of points of reduced cross-section, said points of reduced cross-section consisting of a first metal having a relatively small fusing i^2-t and said points of reduced cross-section having a predetermined fusing i^2-t;
(b) a pair of relatively narrow heat-dam-strip sections to limit axially outward heat flow from said center section, said pair of heat-dam-strip sections being folded in transverse direction and each consisting of a second metal having a relatively large fusing i^2-t, said heat-dam-strip sections having a fusing i^2-t larger than said predetermined fusing i^2-t of said center section to prevent fusion thereof by the flow of an electric current prior to fusion of said center section; and
(c) electroconductive bonds connecting the axially outer ends of said center section to one of said pair of heat-dam-strip sections.

4,216,458
SOLID STATE SWITCH

Jon L. Edwards, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 3, 1978, Ser. No. 921,306
Int. Cl.² H01L 43/04
U.S. Cl. 338—32 H 22 Claims

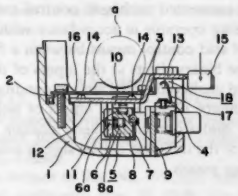


1. A solid state switch comprising:
(a) a base;
(b) a permanent magnet having magnetic poles of opposite polarity on opposite ends thereof;
(c) a Hall Effect generator mounted in fixed position with respect to said base and having output terminal means; and
(d) a rocker member having at least one actuation surfaces, said rocker member being pivotally mounted with respect to said base and mechanically coupled to said magnet, said rocker member being at least partially rotatable in response to downward pressure on said actuation surfaces for sliding said magnet laterally across said base relative to said Hall Effect generator, said Hall Effect generator being responsive to the relative position of said permanent magnet for generating an electric current at said output terminal means in accordance with said relative position.

4,216,459
SIGNAL SWITCHING SYSTEM FOR ACTUATING WINKING LIGHTS TO BE USED FOR TWO-WHEELED VEHICLES

Shoichi Harata, Kasugai; Hirotsugi Kobayashi, and Sohei Hibino, both of Aichi, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Kasugai, Japan

Filed Mar. 1, 1979, Ser. No. 16,611
Claims priority, application Japan, Mar. 2, 1978, 53-26682
Int. Cl.² B62J 3/00
U.S. Cl. 340—134 6 Claims

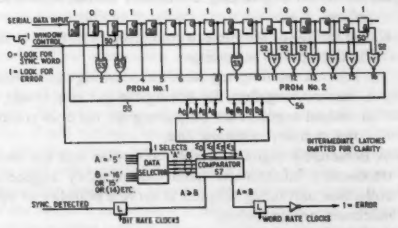


1. A signal switching system for actuating winking lights to be used for two-wheeled vehicles, in which at least one movable electrical contact portion for sending out operational signals for actuating said winking lights is capable of not only being selectively movable toward right and left with respect to a neutral state thereof for selectively contacting one of fixed contacts in accordance with a corresponding movement of an operational lever connected to said movable electrical contact at one portion thereof with respect to a neutral position corresponding to said neutral state of said movable electrical contact portion, but also being arranged to be resiliently brought back to said neutral state thereof, further comprises means to make said operational lever to be resiliently maintained in a substantially upward direction, and a cancelling signal switch means to send out a cancelling signal for winking lights to be put off when said operational lever including said means is pushed substantially downward at said neutral position thereof.

4,216,460
TRANSMISSION AND/OR RECORDING OF DIGITAL SIGNALS

John L. E. Baldwin, Croydon; Robert A. Bellis, Colden Common, and John G. S. Ive, Winchester, all of England, assignors to Independent Broadcasting Authority, London, England

Filed Jul. 12, 1978, Ser. No. 923,972
Claims priority, application United Kingdom, Jul. 14, 1977, 29692/77
Int. Cl.² G06F 11/00
U.S. Cl. 371—57 14 Claims



1. In a digital processing system including analog to digital converting means for converting an analog signal into digital signals in the form of words each consisting of a plurality of binary digits, and encoding means for encoding the digital signals by transforming the same into encoded digital words each having a predetermined number of identical binary digits; the improvement which comprises

(a) control means for controlling said encoding means, said control means being connected with said converting means for receiving a predetermined digit of the digital signals;

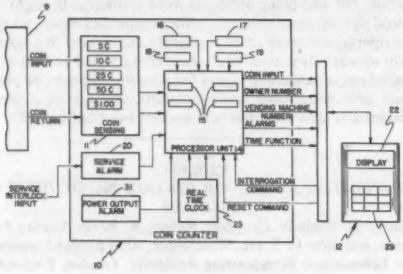
(b) said encoding means further including store means connected with said converting means for storing codes for encoding each of the digital signals; and

(c) gating means for addressing said store means, said gating means having input terminals connected with said converting means for receiving the digital signals, output terminals connected with said store means, and a control terminal connected with said control means, said gating means being operable in accordance with a change in the output of said control means between a first condition in which the binary digits at the inputs of the gating means are passed unaltered, and a second condition complementing the binary digits at the inputs of said gating means, whereby said store means need contain codes for only one-half of the different digital signals available from said converting means.

4,216,461
CODE CONTROLLED MICROCONTROLLER READOUT FROM COIN OPERATED MACHINE

Robert L. Werth, 2053 W. Romneya Dr., Anaheim, Calif. 92801, and Timothy L. Brehm, 27 Golden Star, Irvine, Calif. 92714

Filed Sep. 6, 1977, Ser. No. 830,758
Int. Cl.[2] G08B 25/00; H04Q 9/00; G06K 5/02; G06F 7/00
U.S. Cl. 340—149 R **18 Claims**



1. An apparatus for sensing, totalling and displaying transactions in a vending machine comprising:

1. sensor and totalling means including:

A. means for sensing coin input and output transactions;

B. means for converting the sensed transactions into digit pulses;

C. a plurality of microelectronic circuit registers to receive the digit pulses including:

i. internal totalling registers for counting net coin intake;

ii. memory registers for storing the net coin count; and,

iii. output registers for outputting the net coin count from the memory registers; and,

2. A detachable digital portable collection unit for receiving transaction information from the memory registers, the collection unit being adapted to serve a plurality of vending machines, and including:

A. ROM and RAM memories;

B. a keyboard input;

C. an input register; and,

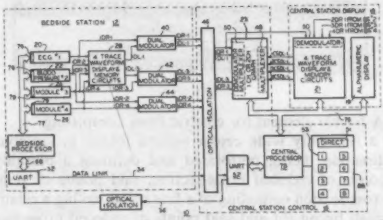
D. a read-out register;

the PCU being adapted for access and interrogation of the output registers for data contained in the memory registers, the collection unit being adapted to input data, code and code changes into the sensor and totalling means.

4,216,462
PATIENT MONITORING AND DATA PROCESSING SYSTEM

William J. McGrath, Delafield, and Regis P. DiGiacomo, Wauwatosa, both of, WI, assignors to General Electric Company, Milwaukee, Wis.

Filed Mar. 6, 1978, Ser. No. 883,730
Int. Cl.[2] H04Q 9/00; H04J 3/00; G06F 3/05
U.S. Cl. 340—150 **6 Claims**

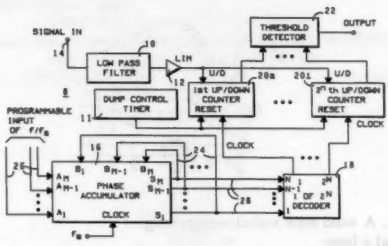


1. An improved patient monitoring and data handling system having a plurality of bedside stations, each for location in the vicinity of a hospitalized patient and each interconnected to a central station having at least one peripheral display unit for displaying monitored data from said bedside stations, wherein each said bedside station includes a bedside processor having a central processing unit for controlling the flow and format of data from said bedside station to said central station; and said central station includes a central processor having a central processing unit for controlling the flow of data from said bedside stations to said peripheral display unit and for communicating with said beside processors.

4,216,463
PROGRAMMABLE DIGITAL TONE DETECTOR

Charles A. Backof, Jr., Hoffman Estates, and David S. Robins, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 10, 1978, Ser. No. 932,734
Int. Cl.[2] H04Q 9/10; H03K 13/02; G06F 3/05; G01K 25/00
U.S. Cl. 340—171 R **10 Claims**



1. Apparatus for detecting at least one of a plurality of tones comprising:

programmable phase accumulator means for generating a digital reference tone representing the phase of the digital reference tone having a predetermined number of output bits;

decoder means for accepting said predetermined number of output bits and for producing output code bits in response thereto;

a plurality of accumulating means, each of said accumulating means being selected by a corresponding one of said output code bits;

input signal means for filtering and digitizing each of the

plurality of tones, each of the plurality of tones having a positive phase and a negative phase, said input signal means having an output to each of said plurality of accumulator means, each said accumulator means being responsive to a simultaneous combination of one of said output code bits and a positive signal input phase; and

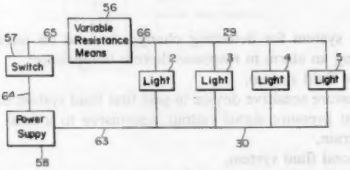
threshold detector means for determining when the absolute value of the difference between a predetermined first pair of said plurality of accumulator means is different by a predetermined count from the absolute value of the difference between a predetermined second pair of said plurality of accumulator means, said threshold detector means having an output signal on at least one output terminal thereof, said output signal being responsive to said predetermined count.

4,216,464

SOUND RESPONSIVE LIGHT DEVICE

Edward E. Terry, 2363 North O'Neal Ave., Charleston, S.C. 29404

Filed Jan. 11, 1979, Ser. No. 2,616
Int. Cl.² G08B *5/22*; F21V *21/12*
U.S. Cl. 340—321 **27 Claims**



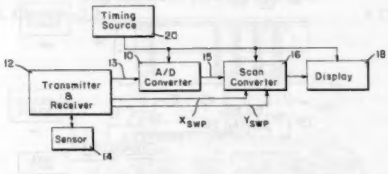
1. A device connected around a body comprising:
(a) a belt;
(b) power means secured to said belt;
(c) sound responsive means secured to said belt;
(d) light means secured to said belt operative responsive to said sound responsive means;
(e) a plurality of belt sections; and
(f) a plurality of fasteners connecting said plurality of belt sections together.

4,216,465

PROGRAMMABLE ANALOG TO DIGITAL CONVERTER

Kenneth A. Huelsman, Carlsbad, and Joe E. Deavenport, San Diego, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 7, 1978, Ser. No. 884,330
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 AD **9 Claims**



1. An analog to digital converter for responding to an input signal to provide binary output signals each representing a different digital level comprising:

first and second sources of potential,

a voltage divider network coupled between said first and second sources of potential and having a plurality of control nodes therebetween,

a plurality of comparator means, each of a different order of binary significance and coupled to said voltage divider network, each of said plurality of comparator means receiving said input signal,

priority encoding means coupled to said plurality of comparator means, and

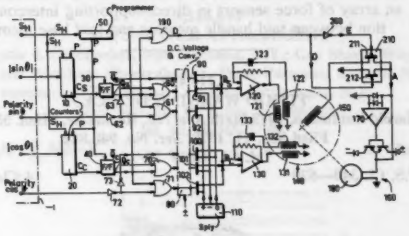
a programmed source of analog voltage coupled to said plurality of control nodes to provide voltages at each of said plurality of control nodes as a plurality of voltage sets with each voltage set representing a group of converter transfer functions, said programmed source including time controlled selection means to provide different ones of said voltage sets to said plurality of control nodes as a function of time.

4,216,466

DIGITAL TO SYNCHRO CONVERTER

Louis Chasson, Valence; Raymond Euvrard, Bourg les Valence, and Paul Romand, Bourg de Peage, all of France, assignors to Crouzet, Paris, France

Continuation-in-part of Ser. No. 775,327, Mar. 7, 1977, abandoned. This application Dec. 13, 1978, Ser. No. 969,215
Claims priority, application France, Mar. 15, 1976, 76 07620
Int. Cl.² H03K *13/02*
U.S. Cl. 340—347 SY **7 Claims**



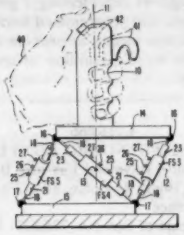
1. In a device for converting into analog form a digital information constituted by four binary numbers representing absolute values and polarities of the sine and cosine trigonometric components of a variable angle, particularly on an air navigation computer of the type embarked on board an aircraft, comprising means for generating calibrated D.C. voltages, analog switches for converting said D.C. voltages into periodic rectangular signals of equal amplitudes, means responsive respectively to the polarities of the sine and cosine of said angle and controlling said switches, means responsive respectively to the absolute values of the sine and cosine of said angle and also controlling said switches, a conventional electro-magnetic counter-reaction resolver comprising a rotor winding and two stator windings to which are respectively applied said periodic rectangular signals via amplifiers, and an angular servocontrol loop comprising another amplifier and said rotor winding, characterized in that said means respectively responsive to the absolute values of the sine and cosine of said angle modulate, for each value of said angle, the respective time durations of said periodic rectangular signals thus proportional to said absolute values, a solid state commutator is disposed between said other amplifier and said rotor winding, each of said amplifiers associated respectively with said stator windings of the resolver possesses a counter-reaction loop comprising a corresponding compensation winding of the resolver and a capacitor connected between said compensation winding and the corresponding amplifier, and means responsive to the output voltages of said means respectively responsive to the absolute values of the sine and cosine of said angle are provided to control said commutator, so as to connect said other amplifier and said rotor winding only in the simultaneous presence of said output voltages, i.e. only in the simultaneous absence of the output voltages of said analog switches.

4,216,467

HAND CONTROLLER

John R. Colston, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,204
Int. Cl.[2] G06F *3/02*; G05G *7/00*
U.S. Cl. 340—365 L 5 Claims



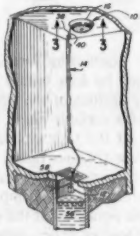
1. A hand controller comprising,
a handle adapted to accept a grip of an operator's hand,
a handle member attached to such handle,
a base member anchored relative to said handle member, and
an array of force sensors in direct-supporting interconnection between said handle member and said base member.

4,216,468

FLOOD WARNING DEVICE

Harold Kaufmann, 1919 Sixth Ave. NE, Rochester, Minn. 55901

Filed Sep. 11, 1978, Ser. No. 940,882
Int. Cl.[2] G01F *23/10*
U.S. Cl. 340—620 4 Claims



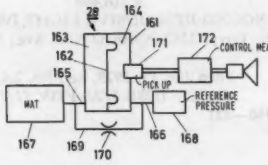
1. An alarm for signalling the rise of water above a preselected danger level, the alarm comprising:
signal means adapted to emit an output signal when energized;
a power means arranged to energize the signal means when a circuit between the power means and signal means is completed;
a combination transmitting line and a sensor for presence of water comprising a pair of elongated electrical conductors, one in electric connection at one end to said signal means and the other in electrical connection at one end to said power means, and the other ends of said elongated electrical conductors being connected to spaced, exposed, sensing terminals that are adapted to be selectively positioned to be exposed to water to be sensed, but only to be responsive to a rising water level to establish a circuit therebetween and through said water whereby to sound the alarm, downwardly opening skirt means surrounding said exposed sensing terminals and extending downwardly below said terminals, for preventing downwardly flowing water from bridging the space between said sensing terminals which could falsely signal a danger condition, and vent means in said skirt permitting rising water to enter said skirt and to electrically bridge the space between said sensing terminals to cause emission of a sound signal.

4,216,469

ALARM SYSTEM FOR DETECTING CHANGES IN LOAD ON TERRAIN

Georg Hirmann, and Bruno Kagi, both of Zurich, Switzerland, assignors to Multisafe AG, Schaan, Liechtenstein

Division of Ser. No. 807,132, Jun. 16, 1977. This application Mar. 24, 1978, Ser. No. 889,840
Claims priority, application Switzerland, Jun. 23, 1976, 8013/76; Mar. 17, 1977, 3376/77; May 16, 1977, 6052/77
Int. Cl.[2] G08B *13/10*
U.S. Cl. 340—666 10 Claims



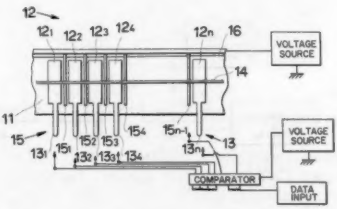
1. A system for detecting changes in load on terrain and actuating an alarm in response thereto comprising:
a first fluid system,
a pressure sensitive device in said first fluid system having a first pressure signal output responsive to a load on the terrain,
a second fluid system,
means in said second fluid system responsive to said first pressure signal output for generating a second pressure signal output,
an alarm, and
a pressure sensitive switch connected to said alarm, said switch being responsive to said second pressure signal output to actuate said alarm.

4,216,470

LUMINESCENT DISPLAY DEVICE HAVING CONDUCTORS FOR FIELD CONTROL

Takao Kishino; Nobuo Yamaguchi, and Yoichi Mera, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Chiba, Japan

Filed Mar. 15, 1978, Ser. No. 886,894
Claims priority, application Japan, Mar. 15, 1977, 52-30421
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—753 3 Claims



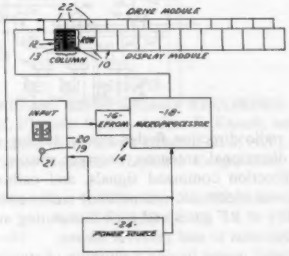
1. In a luminescent display device for providing an analog display of input information, said device having a plurality of segment anodes provided linearly on a substrate and each coated with a luminescent material layer, said segment anodes being selectively given an anode voltage according to said input information by voltage means connected to said segment anodes, and a filament-shaped cathode provided above said

segment anodes for emitting thermions when heated, said thermions emitted from said cathode being adapted to selectively impinge on said segment anodes so as to make them emit light, an improvement comprising a conductor provided above the gap existing between every two adjacent segment anodes, each said conductor being kept positive with respect to said filament-shaped cathode by a voltage means connected to each said conductor.

4,216,471
CONTROL SYSTEM FOR DISPLAY DEVICES AND METHOD

Ronald J. Akred, Sr., St. Clair, Mich., assignor to Baker Electrical Products, Inc., Marine City, Mich.

Filed Sep. 18, 1978, Ser. No. 943,132
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—764 **9 Claims**

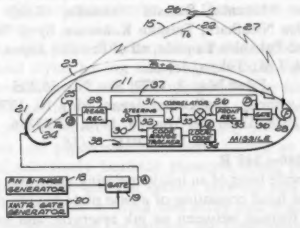


1. A control system for a display with a matrix of image forming display units comprising in combination:
- an input device for indicating an image to be formed on the display;
- a computer responsive to the input device for outputting a series of electrical pulse groups corresponding to the indicated image; and
- a drive module responsive to the electrical pulse groups for inducing separate unit by unit sequential formation of the indicated image by the display characterized by current flow through only one display unit at a time.

4,216,472
GATED PSEUDONOISE SEMI-ACTIVE MISSILE GUIDANCE SYSTEM WITH IMPROVED ILLUMINATOR LEAKAGE REJECTION

Damian F. Albanese, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,985
Int. Cl.[3] G01S *13/00*; **F41G** *7/00*
U.S. Cl. 343—7.3 **8 Claims**

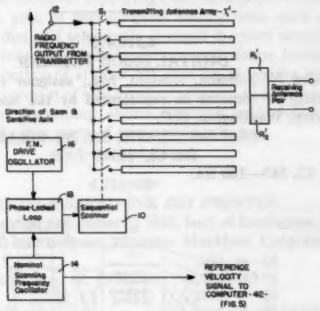


1. In a semi-active pseudonoise missile guidance system having a ground illuminator orientable to cause reflections of electromagnetic energy from a selected target, the combination comprising:
- first means within said ground illuminator for generating a repetitive pseudonoise code word having a predetermined bit duration;
- second means for repetitively selecting and transmitting a corresponding fraction of each bit of said code word to produce a gate pseudonoise transmitted sequence having a predetermined fractional duty cycle;
- front and rear receiving means within said missile, said rear receiving means being responsive to said transmitted sequence for establishing a local code and said front receiving means being responsive to said reflections, said front receiving means also being subject to undesired leakage signals of relatively high intensity from said ground illuminator;
- third means operating from the received signal output of said rear receiving means for producing a leakage gating signal having "on" and "off" times and for applying said gating signal to correspondingly gate the input of said front receiver "on" and "off", said third means being arranged to delay the beginning of said "on" time by a time increment at least equal to the radiation transit time of said transmitted second means output from said rear receiver to said front receiver as said leakage signals.

4,216,473
MIPS HOVER ATTACHMENT

Lester I. Goldfischer, New Rochelle, N.Y.; Gus Stavis, Wayne, and Abraham Shrekenhamer, West Paterson, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 16, 1978, Ser. No. 961,315
Int. Cl.[2] G01S *9/44*
U.S. Cl. 343—8 **14 Claims**



1. In a microwave interference pattern velocity sensor system in which the movement of the velocity sensor is employed to determine velocity of the vehicle in which said sensor is mounted, a combination for enabling the system to sense low velocity, said combination including:
- an antenna array comprising a plurality of antenna elements, and
- means coupled to said antenna elements for sequentially exciting said elements at a particular frequency so as to simulate motion of the array along a particular axis.

4,216,474
PULSE FREQUENCY MODULATOR AND COMPRESSOR FOR STAIRCASE FM RADAR SYSTEMS

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,709
Int. Cl.[2] G01S *9/233*
U.S. Cl. 343—17.2 PC **10 Claims**

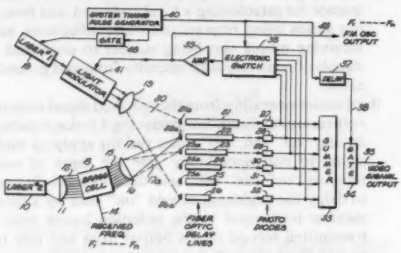
1. In a radar system which transmits a frequency modulated

signal and employs received echo signal pulse compression, the combination comprising:

a source producing a first light energy beam;

a plurality of optical delay lines providing a series of graded delays, each delay corresponding to the time of a discrete frequency in the frequency modulation program of said transmitted signal;

first means for launching said first light energy beam into each of said optical delay lines discretely and selectively in



a program corresponding to said frequency modulation program, said first means including means for deflecting said first light energy beam among the inputs of said delay lines as a function of each of said discrete frequencies extant in a received echo signal corresponding to said transmitted signal;

second means for converting the outputs of said delay lines to electrical signals;

and third means for summing said electrical signals of said second means to provide pulse compression.

4,216,475

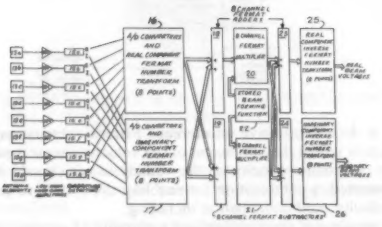
DIGITAL BEAM FORMER

Richard N. Johnson, Adelphi, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1978, Ser. No. 918,132

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—100 SA **15 Claims**



1. A method of forming multiple beams from an array of antenna elements equiangularly spaced about a central point and which provide outputs, comprising the step of spatially convolving said outputs of said equiangularly spaced antenna elements with a beam forming function to provide said multiple beams, wherein said step of convolving utilizes a transform having a convolution property, said step comprising the steps of:

(a) taking the transform of said outputs to produce transformed antenna outputs;

(b) providing a transformed beam forming function;

(c) computing the product of said transformed antenna outputs and said transformed beam forming function; and

(d) taking the inverse transform of said product.

4,216,476

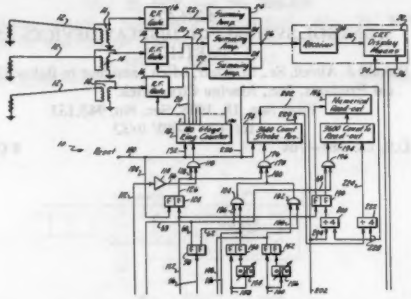
DIGITAL ELECTRONIC COMMUTATOR FOR RADIO DIRECTION FINDING SYSTEM

Richard Lorenz, and Paul E. Martin, both of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1970, Ser. No. 18,023

Int. Cl.[2] G01S *3/20*

U.S. Cl. 343—120 **3 Claims**



1. In a radio direction finder system having an azimuthal array of directional antennas, receiver means, a source of slewing direction command signals, and cathode ray tube display means, electronic commutator means comprising:

a plurality of RF gates and each connecting at least one of said antennas to said receiver means;

ring counter means having a plurality of stages each corresponding to at least one of said RF gates and operative to enable said RF gates to sample radio reception by said antennas sequentially as said ring counter stages are triggered;

a source of signals at a predetermined first frequency;

first digital logic means for deriving signals of a second predetermined frequency from said first frequency signals and applying them as trigger signals to said ring counter means;

second digital logic means for deriving sync signals and sine and cosine signals of a predetermined frequency from said first frequency signals and applying them to said display means whereby sweep of the cathode ray tube thereof is synchronous with operation of said ring counter so that a pattern representative of radio signals about the azimuth is displayed; and

Schmidt trigger means responsive to one of said sync signals to provide signals to said display means for generation of a strobe line as a bearing indicator each sweep of said cathode ray tube.

4,216,477

NOZZLE HEAD OF AN INK-JET PRINTING APPARATUS WITH BUILT-IN FLUID DIODES

Yasumasa Matsuda; Satoshi Shimada; Kanji Kawakami; Motohisa Nishihara; Taisaku Kohzuma; Syoji Sagae; Tetsuo Doi, and Takahiro Yamada, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1979, Ser. No. 35,235

Claims priority, application Japan, May 10, 1978, 53-54444; May 13, 1978, 53-56149; May 18, 1978, 53-58276

Int. Cl.[2] G01D *15/18*

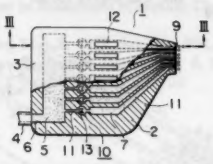
U.S. Cl. 346—140 R **14 Claims**

1. A nozzle head of an ink-jet printing apparatus comprising;

a nozzle head consisting of a base plate having pump chambers formed between an ink reservoir and nozzle holes, and grooves for forming fluid diodes between said pump chambers and said ink reservoir, a covering plate joined to said base plate as a unitary structure, and electromechani-

cal converter elements mounted on said base plate at positions corresponding to said pump chambers;

means for supplying an ink to said pump chambers via said ink reservoir of said nozzle head; and



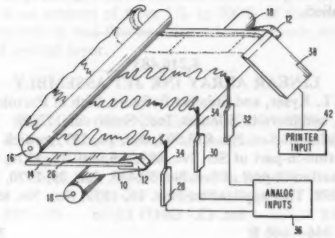
means for changing the volumes of said pump chambers by way of said electromechanical converter elements of said nozzle head responsive to electric signals.

4,216,478

THERMAL STRIP CHART RECORDER

Gary R. Giedd, Pleasant Valley; Arthur F. Karsch, and Sydney L. Lindauer, both of Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1978, Ser. No. 957,784
Int. Cl.[2] G01D *15/10*
U.S. Cl. 346—61 **22 Claims**



1. A strip chart recorder for plotting and printing, comprising:

a viewing platen having a viewing surface;

an edge structure forming a peripheral edge of said viewing surface, said edge structure comprising first and second closely spaced parallel edges and a flat surface between and connecting said first and and second edges;

means for controlling a strip of thermally sensitive chart paper to move at a constant speed around and in contact with said first edge, across said flat surface, around and in contact with said second edge, and then across said viewing surface;

a galvanometric stylus for recording analog signals on said paper, said stylus having an elongate heated tip portion urged toward one of said first or second edges for contact with the paper in a line of contact along said one edge; and

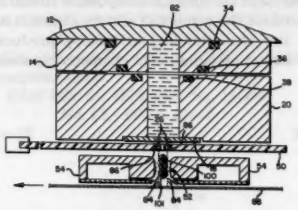
a thermal print head for printing a plurality of lines of characters on said paper, said print head having an elongate array of selectively heatable elements being positioned and urged toward said flat surface between said first and second edges so as to bring said array into contact with said paper along said flat surface, the longitudinal dimension of said array being parallel with said first and second edges.

4,216,479

RESISTIVELY COATED DEFLECTION RIBBON FOR AN INK JET PRINTING DEVICE

Suresh C. Paranjpe, Xenia, and James A. Frey, Kettering, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed Apr. 3, 1978, Ser. No. 892,519
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **3 Claims**



1. In an ink jet printing device for printing on a recording medium and having a printing head providing a continuous supply of ink to a plurality of orifices aligned in two parallel rows to produce a continuous supply of droplets from each orifice, a charging surface downstream of each said orifice for placing a charge on selective ones of said droplets and catching means for catching said selectively charged droplets so as to prevent them from impinging on the recording medium, the improvement comprising:

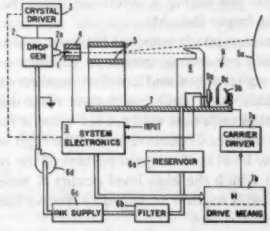
droplets deflection means including a conductive ribbon extending between said rows of orifices downstream from said charging surfaces and upstream from the catching means along the path of travel of said droplets issuing from said orifices, for supplying a continuous electric field across the path of said droplets issuing from each said orifice so that said selectively charged droplets would be deflected into said catching means, said ribbon having a resistive coating of at least 10^4 ohm-cm along the entire path of movement of said droplets adjacent said deflection means for preventing shorts between said deflection means and other parts of said printing device.

4,216,480

MULTIPLE SPEED INK JET PRINTER

William L. Buehner, and James D. Hill, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,417
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **20 Claims**



1. In a continuous ink jet printer in which a carrier carries a nozzle for emitting a stream of ink drops at a predetermined rate, an ink drop charging electrode and ink drop deflection electrodes, said carrier being driven orthogonally with respect to an ink drop receiving medium by a variable speed drive means to effect printing on said medium of characters by scan-

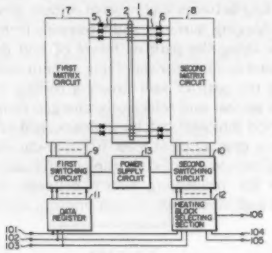
ning of ink drops thereon, a first predetermined character resolution defined by a predetermined maximum number of picture elements per unit of length and height in a predetermined size character box, an improvement in the speed of formed characters on said ink drop receiving medium while maintaining the predetermined rate of sid ink stream, said improvement comprising: means responsive to an applied input signal for increasing the speed of said variable speed drive means, and other circuit means responsive to said applied input signal to reduce the number of picture elements in said predetermined size character box to thereby produce characters having a second predetermined character resolution.

4,216,481

METHOD OF DRIVING A THERMAL HEAD AND APPARATUS THEREFOR

Akiyoshi Hakoyama, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1979, Ser. No. 38,421
Claims priority, application Japan, May 15, 1978, 53-57271
Int. Cl.[2] G01D *15/10*; H05B *1/00*
U.S. Cl. 346—76 PH **3 Claims**



2. An apparatus for driving, in accordance with a recording signal, a thermal head including a plurality of heating blocks each having M aligned heating elements (M: a positive integer), the amplitude of the recording signal being at a low level or at a high level, the apparatus comprising:

means for counting the number of occurrences of the high level in the recording signal;

means for pre-setting a reference value K (K: a positive integer larger than M);

a comparator interconnected between said counting means and said pre-setting means to produce a heating block drive signal when said counted number reaches said pre-set value, said counting means restarting its counting operation each time said pre-set value is reached, the sum of the number of occurrences of the high level and that of the low level in that signal portion of the recording signal within which the high level occurs K times being N;

an M-bit shift register arranged to receive the output of said comparator; and

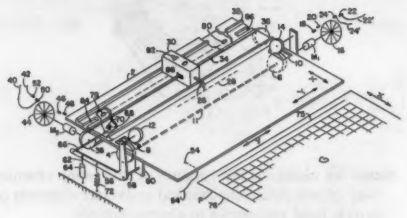
a switching circuit means responsive to the output of said M-bit shift register to select P successive heating blocks for simultaneously enabling the heating elements of the selected heating blocks in accordance with that signal portion of said recording signal within which signal portion the high level occurs not more than K times (P: a positive integer) where $PXM \leqq N < (P+1)XM$.

4,216,482

AUTOMATIC PAPER ALIGNMENT MECHANISM

Martin K. Mason, West Newbury, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 2, 1979, Ser. No. 228
Int. Cl.[2] G01D *15/28*
U.S. Cl. 346—129 **8 Claims**



1. Recording apparatus comprising

a platen,

a plate mounted so as to be closely spaced above said platen,

means for detecting a change in the optical characteristics along a plurality of paths perpendicular to and above said platen at a plurality of inspection points,

first means for selectively applying force at a point on a first side of said platen in either direction along a line in the X direction to a sheet of material when present on said platen, and

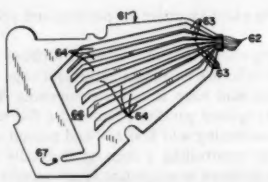
means for selectively inserting a localized obstruction through the space defined between said platen and said plate at a point that is off the line along which the force is applied.

4,216,483

LINEAR ARRAY INK JET ASSEMBLY

Edmond L. Kyser, and Stephan B. Sears, both of Portola Valley, Calif., assignors to Silonics, Inc., Sunnyvale, Calif.

Division of Ser. No. 815,502, Jul. 14, 1977, which is a continuation-in-part of Ser. No. 489,985, Jul. 19, 1974, which is a continuation-in-part of Ser. No. 50,445, Jun. 29, 1970, Pat. No. 3,946,398. This application Nov. 16, 1977, Ser. No. 851,836
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **3 Claims**

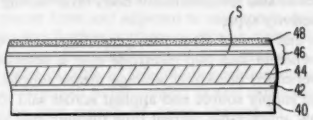


1. In a linear array ink jet assembly: a longitudinally extending housing having a plurality of chambers, each separated from the other by longitudinally spaced wall means; a flexible member spanning said chambers and wall means and operably engaging said wall means to form a seal therebetween; a plurality of spaced-apart actuating means affixed to said flexible member, each of said actuating means being affixed to respective portions of said flexible member corresponding to a respective chamber; each chamber including a droplet orifice longitudinally located between a respective pair of said wall means; said actuating means and said flexible member being so constructed and arranged that upon activation of said actuating means, its respective portion of said flexible member will deform to decrease the volume of its respective chamber.

4,216,484
METHOD OF MANUFACTURING ELECTROLUMINESCENT COMPOUND SEMICONDUCTOR WAFER

Shinichi Hasegawa, and Hisanori Fujita, both of Tsuchiura, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed May 8, 1978, Ser. No. 904,116
Claims priority, application Japan, May 6, 1977, 52-51874
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 35 Claims

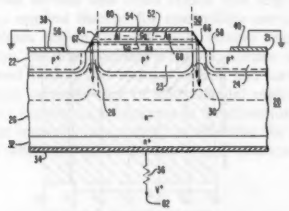


1. An electroluminescent semiconductor wafer having a p-n junction and comprising a monocrystalline substrate, a first layer epitaxially formed on said substrate, said first layer being formed of a Group III-V mixed crystal compound semiconductor composed of a first component including at least one element belonging to Group III of the periodic table and a second component including at least one element belonging to Group V of the periodic table, the mixed crystal ratio of said first and second components being varied continuously, a second layer epitaxially formed on said first layer, said second layer being of a Group III-V mixed crystal compound semiconductor containing said first and second components, the mixed crystal ratio thereof being constant, and a transition layer formed in said second layer, at least one of said first and second components in said transition layer being at least once reduced in an amount of from 1% to 100% of the amount of the at least one of said first and second components needed to form said second layer.

4,216,485
OPTICAL TRANSISTOR STRUCTURE

Derrick J. Page, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 15, 1978, Ser. No. 942,579
Int. Cl.[2] H01S *33/19*
U.S. Cl. 357—19 11 Claims

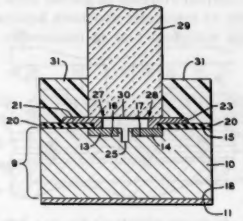


2. An integrated optical power transistor comprising:
a semiconductor diode including a first semiconductor region having a first conductivity type and a second semiconductor region having a second conductivity type;
means for providing current in said semiconductor diode to a load;
means for biasing said semiconductor diode;
energy producing means on the first semiconductor region of said semiconductor diode for emitting coherent radiation in response to an electrical signal;
means for confining said radiation within said energy means; and
first reflecting means coupled to said energy producing means and disposed on an area of the surface of the first semiconductor region of said semiconductor diode for reflecting said light emitted from said laser means through said first reflecting means toward said semiconductor diode for creating electron hole pairs therein and thereby creating electrical current therethrough.

4,216,486
LIGHT EMITTING AND LIGHT DETECTING SEMICONDUCTOR DEVICE FOR INTERFACING WITH AN OPTICAL FIBER

John J. Geddes, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 21, 1979, Ser. No. 13,354
Int. Cl.[2] H01L *31/12*
U.S. Cl. 357—19 20 Claims



1. A light emitting and light detecting semiconductor device having a light emitting zone and a light detecting zone adaptable for concurrently interfacing with an optical fiber, comprising:
a primary region of a first conductivity type;
the light detecting and light emitting zones being of a second conductivity type extending into the primary region from a first surface of the primary region, the zones being separated from each other by a separation region, a junction being formed at an interface between each zone and the primary region, the zones having a depth measured from the first surface; and
a separation material different from the material of the primary region, the separation material extending into at least a portion of the separation region from the first surface to a depth greater than the depth of either zone, the separation material providing substantial optical isolation between the two zones.

4,216,487
BIDIRECTIONAL LIGHT-ACTIVATED THYRISTOR HAVING SUBSTRATE OPTICAL ISOLATION

Nobutake Konishi; Takeshi Yokota; Yoshitaka Sugawara; Tsutomu Yatsuo, and Masahiro Okamura, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

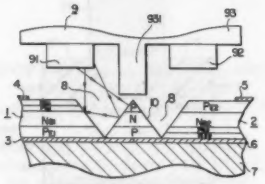
Continuation-in-part of Ser. No. 730,183, Oct. 5, 1976, Pat. No. 4,110,781. This application Feb. 21, 1978, Ser. No. 879,758
Claims priority, application Japan, Oct. 11, 1975, 50-121859
The portion of the term of this patent subsequent to Aug. 29, 1995, has been disclaimed.
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 11 Claims

1. A bidirectional light-activated thyristor comprising:
a semiconductor substrate having a pair of oppositely-positioned main surfaces and a side surface interconnecting said pair of main surfaces,
said semiconductor substrate including a first semiconductor section, a second semiconductor section, and an isolating section disposed between said first and second semiconductor sections for electrically isolating said first semiconductor section and said second semiconductor section from each other,

said first semiconductor section including four contiguous PNPN layers of alternately opposite conductivities arranged so as to form a PN junction between each adjacent ones of said layers, said each PN junction being substantially parallel to said main surfaces, one end P-type layer of said four layers being exposed at one of said pair of main surfaces and the other end N-type layer of said four layers being exposed at the other main surface,

said second semiconductor section including four contiguous PNPN layers of alternately opposite conductivities arranged so as to form a PN junction between each adjacent ones of said layers, said each PN junction being substantially parallel to said main surfaces, one end P-type layer of said four layers being exposed at said other main surface and the other end N-type layer of said four layers being exposed at said one main surface,

first electrode means disposed on said one main surface so as



to be in ohmic contact with said one end P-type layer of said first semiconductor section and said other end N-type layer of said second semiconductor section,

second electrode means disposed on said other main surface so as to be in ohmic contact with said other end N-type layer of said first semiconductor section and said one end P-type layer of said second semiconductor section,

first optical trigger means for applying a light signal to said side surface of said first semiconductor section, so as to trigger said first semiconductor section,

second optical trigger means for applying a light signal to said side surface of said second semiconductor section, so as to trigger said second semiconductor section,

said semiconductor substrate forming means for blocking the passage of a light signal from said first optical trigger means to said second semiconductor section and the passage of a light signal from said second optical trigger means to said first semiconductor section.

4,216,488

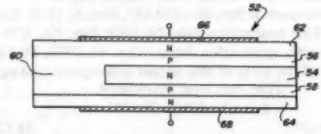
LATERAL SEMICONDUCTOR DIAC

Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234

Continuation of Ser. No. 755,441, Dec. 29, 1976, abandoned. This application Jul. 31, 1978, Ser. No. 929,401

Int. Cl.[2] H01L *29/747*

U.S. Cl. 357—39 **1 Claim**



1. A semiconductor diac comprising:

a semiconductor body including layers of five alternating opposite semiconductor conductivity types,

said central interior layer having a first conductivity type and having two adjacent layers of said second conductivity type on opposite sides thereof,

an appreciable integral single region of said second conductivity type extending through one edge of said central interior layer and integrally connecting said two adjacent layers of said second conductivity type to form a structure including said appreciable integral single region and said two adjacent layers of said second conductivity type having a substantially U-shaped cross-sectional shape to define a gate drive region interior of said semiconductor body adjacent said edge of said central interior layer and within said appreciable integral single region,

a first electrode contacting an exterior surface of a first exterior layer of said semiconductor body having said first conducting type, and

a second electrode contacting an exterior surface of a second exterior of said semiconductor body layer having said first conductivity type,

said first and second electrodes providing a two electrode diac, wherein said two electrode diac is responsive to a predetermined breakover voltage means supplied from a voltage supply source and applied across said electrodes to allow appreciable current flow through said gate drive region to appear as date drive current to cause said two electrode diac to become conductive and to break back to a negative resistance characteristic.

4,216,489

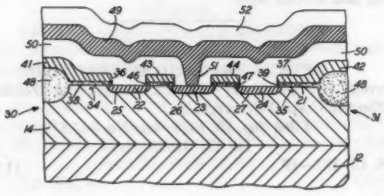
MOS DYNAMIC MEMORY IN A DIFFUSION CURRENT LIMITED SEMICONDUCTOR STRUCTURE

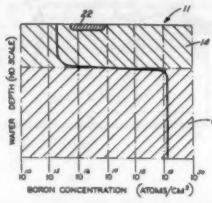
James T. Clemens, Allentown; Dinesh A. Mehta, Bethlehem; James T. Nelson, Coopersburg; Charles W. Pearce, Emmaus, and Robert C. Sun, Whitehall, all of Pa., assignors to Bell Telephone Laboratories, Incorporated and Western Electric Co., Inc., both of New York, N.Y.

Continuation-in-part of Ser. No. 848,000, Nov. 3, 1977, abandoned. This application Jan. 22, 1979, Ser. No. 5,639

Int. Cl.[2] H01L *27/02*

U.S. Cl. 357—41 **10 Claims**





1. An n-channel random access memory device which comprises:

a silicon layered structure which includes a p-type substrate portion of relatively high concentration of its predominant dopant and on one surface thereof a p-type epitaxial layer of relatively lower concentration of its predominant dopant, the epitaxial layer being substantially free of minority carrier-generating harmful impurities and of a thickness which is no more than one-thirtieth the value of the diffusion length of electrons in the layered structure, the layered structure being of a quality that the diffusion length is at least about 500 microns;

a plurality of spaced n-type regions at the upper surface of

the epitaxial layer and of a depth to be entirely enclosed within the epitaxial layer, said n-type regions forming transistor terminals, each terminal forming an n-p junction with the material of the epitaxial layer;

dielectric material overlying the free surface of the epitaxial layer;

conductive portions overlying selected areas of the dielectric material for forming capacitor plates in superposition to regions of the epitaxial layer, said regions forming capacitors being capable of becoming charged upon the application of a signal to a respective one of said n-type regions forming one of the terminals; and

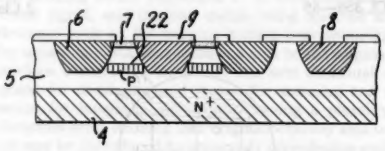
conductive patterned material overlying the dielectric material spaced from and adjacent to said conductive portions and having further portions overlying dielectric material for forming gate electrodes of said transistors, said gate electrodes capable of selectively enabling signals applied to said terminals to be coupled to said capacitors, thereby enabling said signals to cause charges to be stored in respective ones of the capacitors, a decay of said stored charges being substantially limited by the epitaxial layer being substantially free of the harmful impurities and by the proximity of the substrate of relatively high concentration of its predominant dopant limiting the availability charge decaying electrons.

4,216,490

STATIC INDUCTION TRANSISTOR

Toshimi Ohki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Mar. 28, 1978, Ser. No. 891,286
Claims priority, application Japan, Mar. 31, 1977, 52-36775
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—43 **6 Claims**



1. In a static induction transistor having a channel region formed between a drain region and a source region, and a gate region formed around said drain region and responsive to a gate voltage applied thereto for controlling current flowing from said drain region through said channel region to said source region, the improvement which comprises: an impurity region formed within said channel region and having a conductivity type opposite that of said channel region, wherein said impurity region has a thickness in the direction of current flow and an impurity concentration effective for decreasing the current when said gate region is biased by a low level gate voltage.

4,216,491

SEMICONDUCTOR INTEGRATED CIRCUIT ISOLATED THROUGH DIELECTRIC MATERIAL

Takashi Matsuda; Kazuo Niwa, and Yasusuke Sumitomo, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

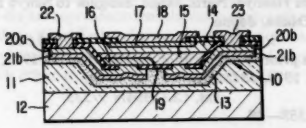
Continuation of Ser. No. 732,544, Oct. 14, 1976, abandoned. This application Aug. 31, 1978, Ser. No. 938,511
Claims priority, application Japan, Oct. 15, 1975, 50-124030
Int. Cl.[2] H01L *27/12, 29/72, 29/46*
U.S. Cl. 357—49 **5 Claims**

1. A semiconductor integrated circuit comprising:

a support body comprised of at least three diverse and adjacent layers; said support body including a layer of semiconductor substrate material; a layer of glass with a concave region located on one side of said layer of glass and with the other side of said layer of glass being substantially planar with said adjacent layer of semiconductor substrate; and a layer of dielectric material located adjacent the one side of said layer of glass that conforms substantially to the concave region located in said layer of glass; said layer of dielectric material having a center section of greater thickness that the remainder of said layer and extending outwardly from said support body;

first and second electrode structures located adjacent said layer of dielectric material and being electrically isolated from each other by the center section of said layer of dielectric material and conforming to the concave shape of said layer of dielectric material;

an insulating layer located adjacent said first and second electrode structures for electrically isolating said first and second electrode structures from a transistor element; said insulating layer having an aperture therein for each of said first and second electrode structures to thereby establish electrical connection to said transistor element through



said first and second electrode structures; said transistor element being comprised of a semiconductor material having: a base region being of one conductivity type electrically connected to said first electrode of the electrode structures; an emitter region of another conductivity type formed in an area of said base region adjacent said second electrode of the electrode structures; and a collector region located adjacent said base region and electrically isolated from said first and second electrode structures by said base region and said insulating layer; said collector region forming the surface layer of said semiconductor integrated circuit; and

at least three surface electrodes electrically isolated from each other by a surface portion of said insulating layer and with at least one of the three surface electrodes being in contact with each of said collector region and said first and second electrode structures; said surface electrodes being in contact with said first and second electrodes through apertures provided within the surface portion of said insulating layer at the surface of said transistor element.

4,216,492

METHOD OF TREATING TELEVISION PICTURE SIGNALS AND WIDE-BAND DATA SIGNALS BY MODULATING THE COLOR CARRIER SIGNAL

Axel Schmalz, Südl. Auffahrtsallee 25, 8000 München 19, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,647
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1977, 2717090
Int. Cl.[2] H04N *5/785, 9/535*
U.S. Cl. 358—16 **17 Claims**

7. A method of treating television color picture signals including a color carrier signal and wide-band data signals representing measured data associated with the subject of said television picture signals on a time synchronous basis, comprising the steps of:

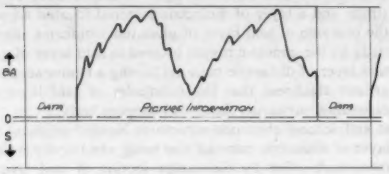
receiving said data signals continuously,

converting said received data signals to digital form,

temporarily storing said data signals in digital form,

multiplexing together said digital data signals and television picture signals by at least one of time and frequency multiplexing techniques, and

recording the multiplexed signals on a recording medium in video recorder means,



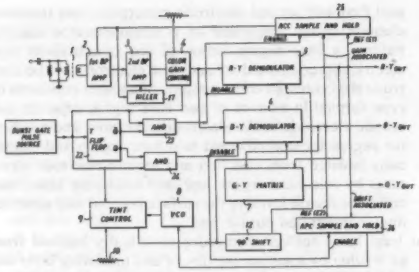
said measured data being recorded by amplitude modulation of said color carrier signal.

4,216,493

CHROMINANCE SIGNAL PROCESSING CIRCUIT IN COLOR TELEVISION RECEIVER

Nobukazu Hosoya, Nara, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Oct. 25, 1978, Ser. No. 954,667
Claims priority, application Japan, Oct. 26, 1977, 52/128862; Mar. 16, 1978, 53/31239
Int. Cl.[2] H04N 9/535
U.S. Cl. 358—28 **14 Claims**



1. A chrominance signal processing circuit in a color television receiver, comprising:

means for amplifying a composite chrominance signal including a burst signal in a line blanking period and a chrominance signal suppression modulated on a subcarrier during a line scanning period,

means for providing a burst gate pulse during said line blanking period,

means for generating a subcarrier,

first chrominance demodulating means responsive to said composite chrominance signal amplifying means and said subcarrier generating means for providing a first chrominance demodulated signal in said line scanning period and for providing a first signal representing the magnitude of said burst signal in said blanking period,

second chrominance demodulating means responsive to said composite chrominance signal amplifying means and said subcarrier generating means for providing a second chrominance demodulated signal in said line scanning period and for providing a second signal representing the phase drift of said subcarrier in said blanking period,

first sample and hold means responsive to said burst gate pulse to be enabled and responsive to said first chrominance demodulating means for sampling said first magnitude representing signal and holding a first level signal representing said first magnitude representing signal, and

second sample and hold means responsive to said burst gate pulse to be enabled and responsive to said second chrominance demodulating means for sampling said second phase drift representing said second phase drift representing signal,

said composite chrominance signal amplifying means comprising a voltage controlled variable gain amplifying means connected to receive as a voltage control signal said first level signal representing said magnitude representing signal,

said subcarrier generating means comprising a voltage controlled variable frequency oscillating means connected to receive as a voltage control signal said second level signal representing said phase drift representing signal;

means coupled to said subcarrier generating means for adjusting the phase of said subcarrier; and

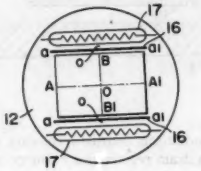
means coupled to said phase adjusting means and responsive to said burst gate pulse for making said subcarrier generating means unresponsive to said phase adjusting means.

4,216,494

TELEVISION CAMERA WITH BIAS LIGHT

Shigeru Ohshima, and Takeshi Sekiguchi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1979, Ser. No. 13,565
Claims priority, application Japan, Feb. 21, 1978, 53-18718
Int. Cl.[2] H04N 9/09
U.S. Cl. 358—55 **2 Claims**



1. A television camera comprising:

an objective lens;

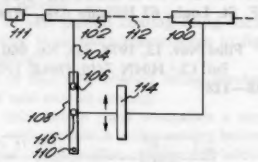
an image pickup apparatus having an image pickup surface on which an image of an object is formed through said objective lens; and

at least one elongated biased light source device disposed outside of the optical path between said objective lens and said image pickup surface, the distribution of quantity of light emitted from said biased light source device along the length thereof being relatively low at the central portion as compared with both end portions.

4,216,495
ELECTRO-OPTICAL SCANNING

Peter J. Neilson, Stroud, and William J. Pickering, Winchcombe, both of England, assignors to Eltra Corporation, Toledo, Ohio

Filed Mar. 10, 1978, Ser. No. 885,245
Int. Cl.[3] G03F 3/08; H04N 1/46, 1/04
U.S. Cl. 358—80 **3 Claims**



1. An apparatus for reproducing a color corrected image from an original comprising:

means for sequentially scanning an elemental area of an original, said elemental area having separate and distinct color bands,

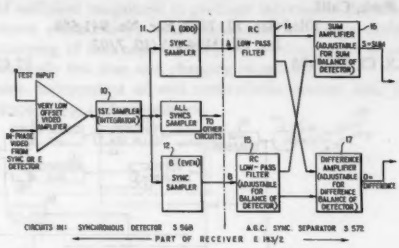
means for generating sequential signals responsive to said color bands, means for simultaneously storing said generated signals, each said signal stored corresponding to said elemental area and to a distinct color band, means for correcting said stored signals to produce a desired balance between said color bands in said elemental area, means for imaging on an image receiving surface, said means for imaging includes a modulating means, and said modulating means connected to said storing means for modulating said imaging means responsive to at least one said corrected signal, said imaging means being directed at an elemental area on the imaging surface corresponding to the sequentially scanned elemental area on the original, to produce a corrected image for the said elemental area means for displacing said means for scanning and said means for imaging, said original having a plurality of elemental areas defining said original whereby said original may be reproduced by separately reproducing each of said original elemental areas and, including a pantograph system having a guide, a first roller bearing mounted for movement in said guide and connected to said imaging means, said guide being mounted for pivotal movement at one end of said guide, a second roller bearing mounted within said guide connected to said scanning means, said second roller bearing mounted in said guide between said first roller bearing and said pivoting means whereby said pantograph transfers parallel movement between said scanning means and said imaging means, and the said position of said first roller bearing relative to said second roller bearing, determining the respective movement of said imaging means to said scanning means.

4,216,496
APPARATUS FOR DETECTING AND MEASURING INTERFERENCE IN TRANSMISSION SIGNALS

John S. Lothian, and Michael D. Windram, both of Winchester, England, assignors to Independent Broadcasting Authority, London, England

Filed Feb. 14, 1979, Ser. No. 12,121
Claims priority, application United Kingdom, Feb. 14, 1978, 5851/78
Int. Cl.[2] H04N 5/44
U.S. Cl. 358—83 **11 Claims**

1. Apparatus for detecting co-channel interference in transmitted signals having sync pulses, comprising means for detecting the sync pulses, and measuring means for determining a change in amplitude of the synch pulses comprising sampling means responsive to said detecting means for deriving a signal indicative of the amplitude of each sync pulse, means for producing a first output indicative of the sum of two successive said signals, means for producing a second output indicative of the difference of the two successive said signals, analogue to digital converter means for producing a digital representation

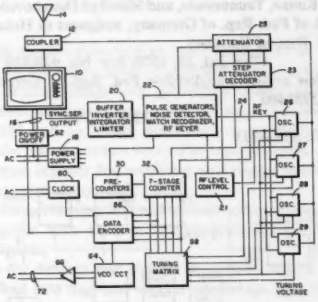

TEST INPUT
VERY LOW OFFSET VIDEO AMPLIFIER
IN-PHASE VIDEO FROM SYNC DIS. E DETECTOR
1ST. SAMPLER (WITCHBANK)
A (ODD) SYNC. SAMPLER
ALL SYNCS SAMPLER
TO OTHER CIRCUITS
B (EVEN) SYNC. SAMPLER
R.C LOW-PASS FILTER
R.C LOW-PASS FILTER (ADJUSTABLE FOR BALANCE OF DETECTOR)
SUM AMPLIFIER (ADJUSTABLE FOR SUM BALANCE OF DETECTOR)
DIFFERENCE AMPLIFIER (ADJUSTABLE FOR DIFFERENCE BALANCE OF DETECTOR)
SUM
DIFFERENCE
CIRCUITS IN: SYNCHRONOUS DETECTOR S 568
A.G.C. SYNC. SEPARATOR S 572
PART OF RECEIVER E 183/2

of said first and second outputs, arithmetic means for producing from said digital representations digital signals indicative of the magnitudes of said signals produced by the sampling means, and subtraction means for subtracting said digital signals from each other to produce a control signal.

4,216,497
APPARATUS FOR MONITORING A MULTICHANNEL RECEIVER

Neal H. Ishman, Springfield; Robert B. Buxton, Burke; Duane A. Durst, Sterling; James F. McArthur, and Michael E. Johnson, both of Falls Church, all of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Oct. 18, 1976, Ser. No. 733,164
Int. Cl.[2] H04N 7/00; H04B 1/00
U.S. Cl. 358—84 **29 Claims**



1. A system for monitoring the operation of a multichannel receiver, where each channel is identified by a selected frequency, comprising in combination:

detector means responsive to a frequency pulse from the receiver to identify a match between a channel frequency and a frequency signal injected into the receiver and generating a match signal, and including a controller for synchronizing the injection of the frequency signal into the receiver with the vertical sync signal at the receiver,

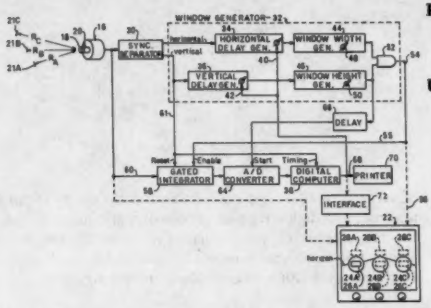
counter means responsive to the match signal for maintaining a count signal related to the channel frequency, and

tuning means responsive to the count signal for generating a sequence of frequency signals injected into the receiver.

4,216,498
VISIBILITY MONITOR EMPLOYING TELEVISION CAMERA

William E. Evans, Los Altos Hills, and William Viezee, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Sep. 12, 1978, Ser. No. 941,688
Int. Cl.[2] H04N 5/30, 7/02
U.S. Cl. 358—93 17 Claims



1. In a visibility monitoring system, or the like, the combination comprising,

video camera means for monitoring an area which includes at least first and second areas having different reflectivities,

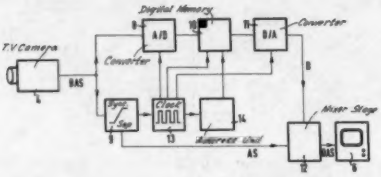
means responsive to the output from said video camera means for generating first and second digitized signals related to the visual birghtness of at least portions of said first and second areas, respectively, and

means including a digital computer responsive to the digitized output from said means for generating said first and second digitized signals for computing a signal value related to said first and second digitized signals.

4,216,499
INSPECTION SYSTEM FOR BAGGAGE

Claus Kunze, Taunusstein, and Manfred Dennhoven, Wiesbaden, both of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Jul. 28, 1978, Ser. No. 928,822
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735400
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—111 3 Claims

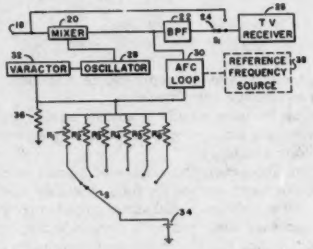


1. Apparatus for the inspection of baggage pieces and the like, comprising an X-ray flash generator whose radiation penetrates the object to be inspected, and produces therefrom a shadow image on a fluorescent screen, a television camera disposed to scan such a shadow image for forming an interlaced image frame of two so-called half image frames, an analog-digital-converter to which the output of the camera tube, in the form of a half image frame, is supplied, image storage means in the form of a solid state digital memory with a storage capacity for the image points of the lines of a half image frame with 6 to 8 bits per image point of the stored signal, for storing the digital signals of a half image frame supplied from said converter, a television monitor for reproducing the stored half image frame, and a digital/analog-converter connecting the television monitor and said digital memory for supplying the stored signals therein, in the form of analog signals, to said television monitor.

4,216,500
ENCODING AND DECODING SYSTEM

Raymond F. St. Louis, 67 Hillside Ave., West Caldwell, N.J. 07006

Filed Nov. 13, 1978, Ser. No. 960,178
Int. Cl.[2] H04N 7/16; H04K 1/02
U.S. Cl. 358—118 3 Claims



1. A system for encoding and decoding a modulated carrier wave, comprising

an encoder comprised of means for varying the frequency of the carrier wave and the frequencies of the modulation thereof, when present, with respect to their normal values in a cyclic manner so that the frequency of the carrier wave varies beyond limits that can be accommodated by the automatic fine tuning circuit of a receiver,

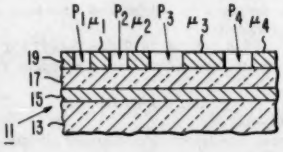
a decoder comprising means responsive to the said cyclic variation of the frequency of the carrier wave with respect to its normal value for producing an alternating current frequency wave that varies with respect to a frequency different from the normal frequency of said carrier wave in the same cyclic manner, and

means for heterodyning the carrier wave and the modulations thereof with the alternating current frequency wave supplied by said decoder so as to produce a carrier wave and modulations thereof that have frequencies that are substantially free from the said cyclic variation.

4,216,501
OPTICAL ANTI-REFLECTIVE INFORMATION RECORD

Alan E. Bell, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 782,032, Mar. 28, 1977. This application Dec. 11, 1978, Ser. No. 968,415
Int. Cl.[2] H04N 5/76; G11B 7/24; G01D 15/34
U.S. Cl. 358—128.5 12 Claims



1. An information record, for use in playback apparatus employing a playback beam of light of a given frequency; said record comprising:

a substrate having a light reflecting surface at said given frequency;

a first coating overlying said light reflecting surface, said coating being substantially transparent at said given frequency for permitting at least a portion of said light beam to pass through said first coating to said light reflecting surface; and

a second coating of a metallic material which is highly absorptive to light of said given frequency overlying said first coating, said second coating having an information track formed therein;

the thickness of said second coating being such that said second coating is partially transmissive to light of said given frequency;

the thickness of said first coating being greater than the thickness of said second coating;

wherein said information track comprises a succession of spaced pits, with variations in the spacing between successive pit edges representative of recorded information;

wherein the thickness of said second coating in all regions other than those occupied by said pits is so related to the thickness of said first coating and the optical constants of said substrate and the respective materials of said first coating and said second coating so as to establish a substantially anti-reflective condition for all of said nonpit regions at said given frequency with respect to the light beam incident on said second coating; and

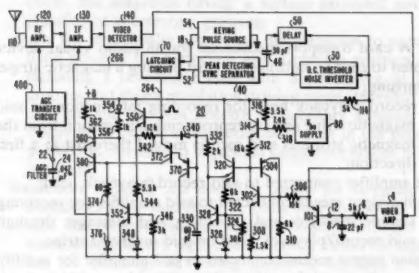
wherein the thickness of said second coating in those regions occupied by said pits is less than the thickness required to establish an anti-reflective condition in said pit regions.

4,216,502

PEAK DETECTOR CIRCUIT

Edward C. Fox, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,834
Int. Cl.² H04N 5/52
U.S. Cl. 358—176 **7 Claims**



3. In a television automatic gain control circuit for developing an automatic gain control voltage, a peak detector circuit for detecting the peaks of the synchronizing signal components of a composite video signal having synchronizing signal components of different time duration comprising:

a network including a capacitor serially coupled to a charging impedance and having a time constant suitable for responding to the peak amplitudes of said synchronizing signal components;

semiconductor means having an input for receiving said composite video signal and an output coupled to said charging impedance for charging said capacitor toward the peaks of said synchronizing signal components, said semiconductor means exhibiting an impedance which is subject to increase with a decrease in current drawn therethrough;

a controllable current sink responsive to the composite video signal at the input of said semiconductor means and coupled to the output of said semiconductor means for drawing a component of current through said semiconductor means during the charging of said capacitor which is supplemental to the capacitor charging current drawn therethrough, said supplemental current component being of sufficient magnitude to preclude increase of the impedance exhibited by said semiconductor means during charging of said capacitor beyond a value which is substantially less than said charging impedance; and

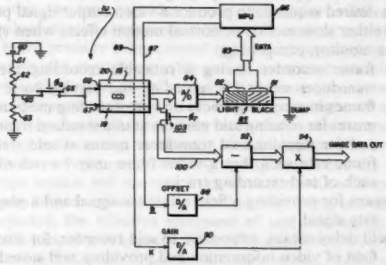
means, independent of said controllable current sink, for discharging said capacitor.

4,216,503

SIGNAL RESTORATION AND GAIN CONTROL FOR IMAGE VIEWING DEVICES

Douglas G. Wiggins, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1979, Ser. No. 23,570
Int. Cl.² H04N 1/40, 1/04, 3/12
U.S. Cl. 358—280 **9 Claims**



1. An image signal restoration and gain control for an image scanning device having an array of photosensitive elements for viewing an original image and generating image signals in response thereto, said image signals each being comprised of an offset potential and an image potential proportional to the intensity of the image portion viewed by said elements, and at least one output register for receiving said image signals, the improvement comprising:

(a) means for generating first and second nonimage signals in said register with each of a predetermined number of image signals;

(b) means for driving said rigister to serially output image signals and said first and second non-image signals from said register;

(c) means for separating said first and second non-image signals from image signals output from said register;

(d) processing means for determining from said first and second non-image signals an offset potential and a signal gain factor required to bring the image signals to a preset signal level;

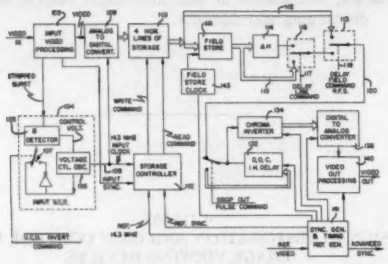
(e) signal restoring means for removing said offset potential from succeeding image signals output by said scanning device to restore succeeding image signals to a substantially absolute level; and

(f) gain correcting means for adjusting the potential level of said succeeding image signals in accordance with said gain factor to provide image signals at a preset signal level.

4,216,504
SLOW MOTION COLOR VIDEO RECORDING AND PLAYBACK SYSTEM

Touraj Boussina, Sunnyvale; Philip M. Crosno, Cupertino; William F. Herzog, San Martin; Vincent D. Kasprzak, Santa Clara, and Boyd L. Stratton, Woodside, all of Calif., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Apr. 7, 1978, Ser. No. 894,412
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—8 **8 Claims**



1. A video recorder and playback system for storing video information consisting of video frames successively presented at a standard frame rate, each of said frames including a first video field of a first field type and a second video field of a second field type, and for playing back said video information in a desired sequence to produce a video output signal providing either slow motion or normal motion effects when viewed on a monitor, comprising:

a frame recorder having a rotatable recording medium, transducer means for recording and playing back video frames in recording tracks on said recording medium, and means for rotating said medium at said standard frame rate and for stepping said transducer means at said standard frame rate such that a video frame may be recorded in each of said recording tracks,

means for providing a field reference signal and a playback rate signal,

field delay means, responsive to said recorder, for storing a field of video information and providing said stored field at its output,

stepping means for stepping said transducer means during playback to recording tracks on said recording medium in accordance with a sequence control signal,

switch means for providing said video output signal at its switch output, said switch means connecting said switch output to said field delay means output or, alternatively, to said recorder in response to a delay field signal, and

logic means, responsive to said field reference signal and said playback rate signal, for providing said sequence control signal to said stepping means and for providing said delay field signal to said switch means,

whereby video information may be replayed as recorded or in a different sequence from that in which it was recorded, the sequence of fields within the frames of the replayed video information being such that it consists of alternately presented fields of a first field type and a second field type.

4,216,505
TRANSDUCER HEAD VIBRATION DAMPENING

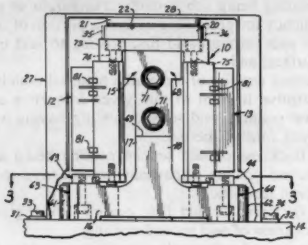
Frederic F. Grant, Bellflower, and Henry M. Martija, La Verne, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 5, 1978, Ser. No. 966,676
Int. Cl.[2] G11B *21/16, 5/48*
U.S. Cl. 360—104 **29 Claims**

1. A method of dampening vibrations of a transducer head structure, comprising in combination the steps of:

providing a metallic mass;

frictionally engaging said transducer head structure with said metallic mass; and

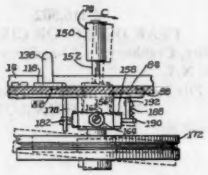


dampening vibrations of said transducer head structure by relative displacement between said mass and frictionally engaged transducer head structure.

4,216,506
CARD TRANSPORT MECHANSIM

Gerald W. Ludtke, Chicago; Glenn A. Butler, Hanover Park, and George F. Krtous, Chicago, all of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 12, 1978, Ser. No. 868,775
Int. Cl.[2] G11B *15/48, 5/54*
U.S. Cl. 360—74.1 **5 Claims**



1. A card transport mechanism for an audio visual device adapted to read an information card bearing a magnetic stripe, comprising:

a record/playback head for recording information on said magnetic stripe and for reproducing information from the magnetic stripe as said card is moved therepast in a first direction;

an amplifier connected to said record/playback head;

sound input means connected to said amplifier for receiving audible messages and recording said messages through said record/playback head on said magnetic stripe;

sound output means connected to said amplifier for audibly reproducing information through said record/playback head from said magnetic stripe;

card transport means including a rotatable capstan for engaging said card and maintaining the magnetic stripe on said card in engagement with said record/playback head when said card is moved thereby in said first direction;

record/playback head mounting means for movably mounting said head for movement into and out of engagement with said magnetic stripe;

selectively operable repeat switch means connected to said card moving means and said head mounting means for selectively moving said head out of engagement with said magnetic stripe and for reversing said card moving means to move said card in a second direction;

means mounting said capstan for pivotal movement between a first position for frictionally driving said information card in said first direction and a second position for frictionally driving said information card in said second direction; and

link means connecting said capstan mounting means to said switch means for selective pivotal movement of said rotatable capstan between said first and second positions by actuation of said switch means, said link means including a movable, horizontal slide plate connected to said head mounting means and cam means on said link means for pivoting said capstan between said first and second position upon actuation of said repeat switch.

4,216,507

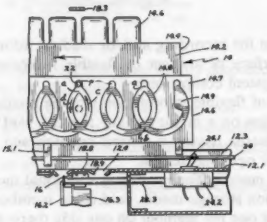
AUTOMATIC TAPE PLAYER-CHANGER

Dean W. Flygstad, St. Paul, and James F. Petelle, Hopkins, both of Minn., assignors to Telex Communications, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 720,817, Sep. 7, 1976, abandoned. This application May 9, 1978, Ser. No. 904,446

Int. Cl.[2] G11B *15/68, 21/08*

U.S. Cl. 360—92 **14 Claims**



1. In a magnetic tape player-changer for automatically sequentially playing multi-track endless magnetic tapes housed in cartridges;

a transducer;

a magazine for housing a plurality of the cartridges, and a track guiding the magazine for sequentially advancing cartridges into a playing position with respect to the transducer, the magazine having a surface provided with a plurality of intersecting grooves;

means for sequentially advancing the magazine to sequentially position the cartridges into a playing position and including a revolvable cam with a pin riding in said grooves and single revolution driving means therefor, the cam pin and grooves coating to smoothly advance the magazine to position sequential cartridges in the playing position in response to sequential single revolutions of the cam; and

transducer stepping and counting means for stepping the transducer from one track or track pair to another of a tape and for counting the number of steps afforded the transducer for each tape, and including means for signaling the cartridge advancing means to advance a new cartridge into the playing position when all of the tracks of the preceding cartridge have been played and the corresponding number of steps have been counted and to return the transducer to its initial position for playing the first track or track pair of the tape in the new cartridge.

4,216,508

TAPE CARTRIDGE TENSIONING AND EJECTING MECHANISM

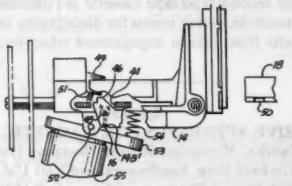
Alexander Hunter, Chalfont, Pa., assignor to Transaction Management, Inc., Montgomeryville, Pa.

Filed Jul. 24, 1978, Ser. No. 926,315

Int. Cl.[2] G11B *15/00*

U.S. Cl. 360—93 **5 Claims**

1. A tape cartridge tensioning and ejecting mechanism comprising a table portion adapted to receive a tape cartridge, guide means operatively positioned on said table portion to restrain said tape cartridge to movement along a predetermined path relative to said table portion, tape cartridge locking means adapted to lock said tape cartridge upon insertion against further relative movement with respect to said table portion; a capstan assembly for driving a tape within said tape cartridge, said capstan assembly comprising a drive wheel, a motor, and a drive shaft, said drive wheel being mounted on said drive shaft and driven by said motor; a bracket pivotally attached at a pivot point to the underside of said table portion for mounting said capstan assembly, a restoring spring operatively positioned between said bracket and said table portion; said restoring spring being normally operative in the absence of a tape cartridge to cause said drive wheel and that portion of said drive shaft of said capstan assembly which projects above the surface of the table portion upon which the tape cartridge is inserted to tilt into the path of said tape cartridge such that upon insertion of a tape cartridge into said mechanism and translation thereof across said table portion a portion of the



tape within the tape cartridge comes into contact with said drive wheel of said capstan assembly which capstan assembly yields to the pressure being exerted upon said tape cartridge so as to cause said capstan assembly and its associated mounting bracket to pivot about said pivot point at the same time increasing the compression force in said restoring spring until said tape cartridge has been completely inserted into said cartridge tensioning and ejecting mechanism at which point the compressive force within said restoring spring establishes the desired tape tension and operates in conjunction with said locking means to prevent said tape cartridge from being automatically ejected, the selective ejectment of said tape cartridge being effected upon release of said locking means whereby said compressive force stored in the restoring spring causes said drive shaft and drive wheel to translate said tape cartridge across said table portion causing said tape cartridge to be ejected therefrom.

4,216,509

CASSETTE PLAYER/RECORDER INTERCHANGEABLY HANDLING CASSETTES OF TWO SIZES

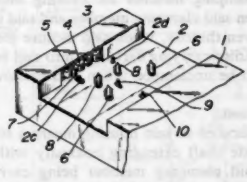
Masaaki Sato, and Shinichi Saito, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1978, Ser. No. 948,217

Claims priority, application Japan, Oct. 4, 1977, 52-119293

Int. Cl.[2] G11B *15/18, 15/24*

U.S. Cl. 360—94 **1 Claim**



1. A magnetic tape player-recorder particularly suited for interchangeably operating with a first type tape cassette of a smaller size and a second type tape cassette of a size larger than

said first type tape cassette, said player-recorder comprising: a housing; means defining a cassette receiving portion in said housing for mounting in operative engagement therein either of said first and said second type tape cassettes; at least one magnetic head and pinch roller provided in a position relative to said cassette receiving portion for operative engagement with either of a first and said second type tape cassette mounted therein; a first pair of drive shafts extending into said cassette receiving portion for operative engagement with a first type tape cassette mounted therein; a second pair of drive shafts located to extend into said cassette receiving portion for operative engagement with a second type tape cassette mounted therein; said second pair of drive shafts being located so as not to interfere with operative mounting of said first type tape cassette in said cassette receiving portion; and means for driving said first pair drive shafts and for permitting said first pair of drive shafts to be moved to a retracted position outside said cassette receiving portion by a second type tape cassette when said second type tape cassette is mounted therein, said driving means including means for disengaging said first pair of drive shafts from driven engagement when in said retracted position.

4,216,510

DRIVE APPARATUS FOR MAGNETIC DISCS

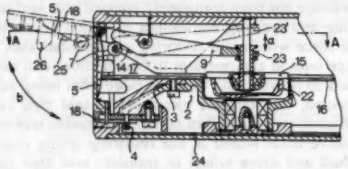
Klaus Manzke, Westheim; Roland Brotzler, Hochdorf-Assenheim; Gerhard Berg, Sandhausen, and Karl Uhl, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 11, 1978, Ser. No. 895,457

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1977, 2716848

Int. Cl.[2] G11B *17/02*

U.S. Cl. 360—99 **11 Claims**



1. In a drive apparatus for flexible magnetic discs each carried in a flat rectangular cartridge having a central opening through which a central annular portion of the disc is driven in operation, said apparatus comprising means for receiving and driving said disc, said driving means including a rotatable clamping member and a driven recessed member cooperating with said clamping member, and said receiving means including a housing means having a closure member hinged about an axis perpendicular to that of said driven member and providing access to a horizontally extending disc cartridge insertion slot, there being provided linking means between said closure member and said clamping member for causing said disc to be clamped between said clamping member and said driven member, and be driven thereby, when said closure member, upon insertion of said disc carrying cartridge into said entrance slot, is closed, and to be unclamped when said closure member is opened,

the improvement,

that there is secured to said housing means a relatively stationary guide shaft extending coaxially with said drive member, said clamping member being carried by said guide shaft for straight axial sliding movement therealong, under the control of said linking means, vertically towards and away from the operating plane of said disc, and

that said closure member is provided with locking means for automatically locking and unlocking said closure member incident to said closure member being manually closed and opened, respectively.

4,216,511

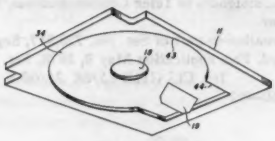
FLEXIBLE MAGNETIC RECORDING DISC WITH CARTRIDGE HAVING A LATCHING DRIVE MEMBER

Frank T. Bilek, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1977, Ser. No. 848,183

Int. Cl.[2] G11B *23/02, 5/012*

U.S. Cl. 360—133 **24 Claims**



1. A system for recording and/or reading information on a recording surface of a sheet of flexible information storage media, said system comprising:

(a) a sheet of flexible information storage media for storing information on a major surface thereof, said information storage media having a central opening and at least one off-center opening therein;

(b) a drive member for providing rotational motion to said information storage media, said drive member having:

(i) at least one pin member on one side thereof which is in permanent engagement with the respective at least one off-center opening in said information storage media, said at least one off-center opening having a larger perimeter than the perimeter of said at least one cooperating pin member so that said information storage media is free to move laterally along said pin member,

(ii) a centrally located recess on the opposite side thereof, and

(iii) a latch member in the form of a radial projection formed on a wall of said recess and extending inwardly therefrom; and

(c) a cartridge housing in the form of a rigid envelope having a chamber containing said information storage media and said drive member, said cartridge housing having:

(i) a first relatively flat surface with an opening for receiving a recording and/or playback head therethrough, said first relatively flat surface being in facing relationship to a first major surface of said information storage media, and

(ii) a second relatively flat surface opposite said first relatively flat surface, said second relatively flat surface being in facing relationship to a second major surface of said information storage media; and

(d) rotational means for engaging said drive member and providing rotational motion to said information storage media, said rotational means having a latch member extending radially outward to engage with the latch member of said drive member for rotating said information storage media.

4,216,512

DISC RECORDER WITH BRUSHLESS DC MOTOR DRIVE

Mohan P. Vidwans, Saline, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Filed Aug. 21, 1978, Ser. No. 935,510

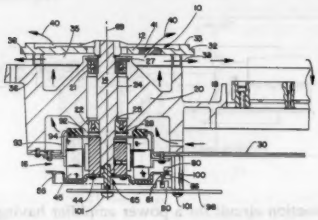
Int. Cl.[2] G11B *23/00*

U.S. Cl. 360—133 **16 Claims**

1. A disc-drive spindle assembly and means for mounting the same in a disc recorder comprising in combination:

a disc recorder frame;

a sealed enclosure surrounding said frame;
a disc rotor disposed within said enclosure for mounting a recording disc and circulating air within said enclosure;
a brushless DC motor;
bearing means disposed in said frame;
a shaft supported by said bearing means, said shaft extending outside said sealed enclosure and directly coupling said disc rotor and said motor; means for grounding said shaft including a socket which comprises:



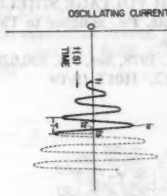
an electrically conductive plug fixedly disposed on the axial centerline of said shaft;
a carbon sphere disposed in said plug; and
an electrically conductive leaf spring contacting and urging said sphere into said socket, said spring being electrically connected to ground;
whereby contamination with said sealed enclosure is minimized.

4,216,513

D.C. CIRCUIT BREAKER

Shunji Tokuyama, and Hiroyuki Sugawara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 15, 1978, Ser. No. 906,263
Claims priority, application Japan, May 18, 1977, 52-56347
Int. Cl.² H02H 7/22
U.S. Cl. 361—13 **8 Claims**



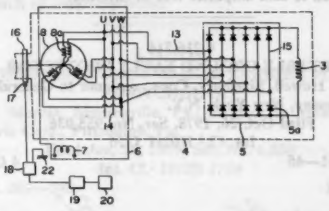
1. A d-c circuit breaker which produces current zero to break d-c current by superposing an oscillating current on the d-c current, comprising:
an interruptor for breaking the d-c current within the negative arc resistance characteristic region while said interruptor is mechanically opened to break the d-c current;
a capacitor without being charged being electrically connected in parallel with said interruptor at least simultaneously with the mechanical opening of said interruptor; and
an inductance electrically connected in series with said interruptor and said capacitor, the capacitance of said capacitor and the amount of inductance of said inductance being selected such that the oscillating current of predetermined frequency is produced and the amplitude of the oscillating current is gradually increased when said interruptor is mechanically opened to break the d-c current;
wherein said interruptor breaks the d-c current when the sum of the d-c current and the oscillating current across said interruptor reaches zero.

4,216,514

PROTECTIVE DEVICE FOR BRUSHLESS EXCITING DEVICE

Nobutada Amagasa, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,262
Claims priority, application Japan, Jul. 26, 1977, 52-90181
Int. Cl.² H02H 7/06
U.S. Cl. 361—20 **4 Claims**



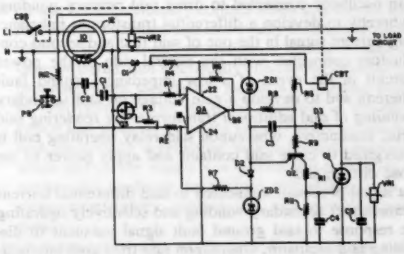
1. In a protective device for a brushless exciting device for exciting a field winding of a synchronous machine by rectifying an output of an AC exciting device by a rotary rectifier, the improvement comprising: means for transmitting a signal between a neutral point of an armature winding of said AC exciting device and ground, said means for transmitting including a movable means and a stationary means for transmitting said signal between said neutral point of the armature winding and ground whereby said movable means rotates with the armature and said rotary rectifier; means for determining the frequency of said signal transmitted from said means for transmitting a signal, said means for determining being operatively connected between said stationary means and ground; means for comparing the frequency of said signal determined by said means for determining with a predetermined frequency value, the output signal from said means for comparing being a difference value between the frequency determined by said means for determining and the predetermined frequency value; and, means for detecting abnormalities in the difference value output signal from said means for comparing, the output from said means for detecting abnormalities bearing an indication of faults in said brushless exciting device.

4,216,515

GROUND FAULT INTERRUPTER

Donald L. Van Zeeland, Franklin, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 28, 1973, Ser. No. 345,731
Int. Cl.² H02H 3/28
U.S. Cl. 361—45 **10 Claims**



1. Ground fault interrupter apparatus, exhibiting reduced

sensitivity to capacitive ground faults and suitable for economical and compact fabrication, comprising:

a differential current transformer having a magnetic core for association with primary windings that are conductors of an electrical system to be protected by the apparatus and also having a sensing element for sensing current unbalance between the primary windings;

an amplifier having at least one input terminal connected with said sensing element, and

bias supply means for supplying to said amplifier a bias potential that is periodically zero and comprising a rectifier for half wave rectifying AC line voltage and the half-wave rectified potential produced by said rectifier is supplied to said amplifier free of filtering.

4,216,516

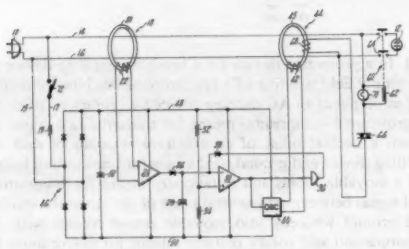
PORTABLE GROUND FAULT PROTECTOR

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 955,036

Int. Cl.[2] H02H *3/26*

U.S. Cl. 361—45 **4 Claims**



1. A ground fault protector comprising, in combination:

A. first and second conductors for respective electrical connection between the line and neutral sides of a power circuit and a load circuit;

B. a relay having

(1) an operating coil, and

(2) a pair of normally open contacts individually connected in series with said first and second conductors;

C. a triac connected in series with said relay operating coil across said first and second conductors, said triac including a gate;

D. a differential current transformer coupled with said first and second conductors and having a secondary winding in which is developed a ground fault signal proportional to an imbalance in the currents flowing in said first and second conductors;

E. an additional transformer coupled with said first and second conductors, said transformer including a primary winding and a secondary winding connected in circuit with said gate of said triac;

F. an oscillator connected to drive said primary winding, whereby to develop a differential transformer imbalancing current signal in the one of said first and second conductors connected with the neutral side of the power circuit in the event of a low impedance ground fault thereon and to develop a gate voltage on said secondary winding of said additional transformer for rendering said triac conductive, whereupon said relay operating coil is energized to close said contacts and apply power to the load circuit; and

G. a signal processor connected to said differential current transformer secondary winding and selectively operating in response to said ground fault signal pursuant to disabling said oscillator, whereupon said triac goes into nonconduction and said relay contacts open to remove power from the load circuit.

4,216,517

PROTECTION CIRCUIT FOR POWER AMPLIFIER

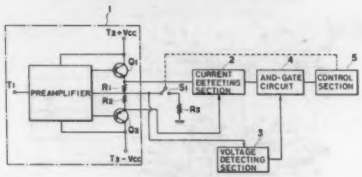
Shinobu Takahashi, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,759

Claims priority, application Japan, May 25, 1977, 52-67239[U]

Int. Cl.[2] H02H *7/20*

U.S. Cl. 361—79 **6 Claims**



1. A protection circuit for a power amplifier having a load against a short-circuit of the load comprising:

(a) a current detecting means for detecting a first level of a load current flowing through the load,

(b) a voltage detecting means for detecting a second level of a voltage across the load,

(c) a logic means responsive to outputs of said current detecting means and voltage detecting means to provide an output only when the load current flows above said first level while the load voltage drops below said second level,

(d) a switch means operable to connect and disconnect said load to said amplifier, and

(e) a control means responsive to the output of said logic means for controlling said switch means to disconnect the load from the amplifier.

4,216,518

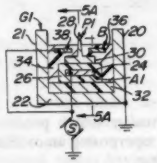
CAPACITIVELY COUPLED STATIC ELIMINATOR WITH HIGH VOLTAGE SHIELD

Dolph Simons, Philadelphia, Pa., assignor to The Simco Company, Inc., Lansdale, Pa.

Filed Aug. 1, 1978, Ser. No. 930,028

Int. Cl.[2] H01T *19/04*

U.S. Cl. 361—213 **15 Claims**

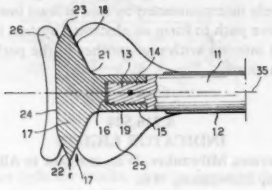


1. In a static neutralizer having at least one discharge electrode adjacently spaced from a conductive member connected to the ground side of an A.C. high voltage power source and first means capacitively coupling each discharge electrode to the high voltage side of said A.C. power source, the improvement comprising a conductive shield spaced intermediate said grounded conductive member and said first means, and means connecting said conductive shield to the high voltage side of the A.C. power source in order to minimize the capacitive coupling between said first means and said conductive member, the improvement being further characterin that said first means is of flat plate configuration, and said discharge electrode constitutes a point outwardly projecting therefrom.

4,216,519
ELECTROSTATIC DISCHARGER, PARTICULARLY FOR AIRCRAFTS

Jean-Louis Boulay, Chatenay-Malabry, and Roland J. Hoarau, L'Hay-Les-Roses, both of France, assignors to Office National d'Etudes et de Recherches Aerospatiales (ONERA), Chatillon, France

Filed Apr. 14, 1978, Ser. No. 896,587
Claims priority, application France, Apr. 19, 1977, 77 11763
Int. Cl.[2] H05F *3/04*
U.S. Cl. 361—218 8 Claims

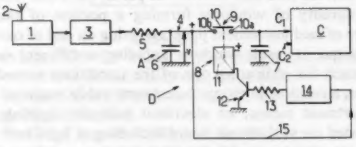


1. An electrostatic discharger for an aircraft, comprising:
a stem of high electric resistivity having one end provided with fastening means for securing same to an aircraft body; and
an enlarged head on the other end of said stem centered on the axis thereof, said head having an annular zone of homogeneous resistive material forming a continuous circular charge-emitting edge in a plane transverse to said axis, said edge having a diameter substantially exceeding that of said stem and being bounded by two substantially flat annular surfaces converging at an acute angle.

4,216,520
SPEED RESTRICTION CONTROL DEVICE FOR VEHICLES, PARTICULARLY MOTOR VEHICLES

Michel Y. Horblin, Courbevoie, France, assignor to Societe Anonyme Automobiles Citroen and Automobiles Peugeot, both of Paris, France

Filed May 15, 1978, Ser. No. 906,215
Claims priority, application France, May 23, 1977, 77 15687
Int. Cl.[2] B60K *31/00*
U.S. Cl. 361—239 7 Claims

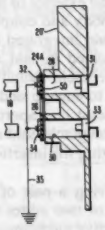


1. A device for automatically controlling a speed restriction of a vehicle travelling over a stretch of speed restricted road, from information transmitted by radio waves from outside the vehicle, said transmitted information being in the form of a square wave signal, comprising:
receiving means mounted on the vehicle for collecting the outside information;
means for providing an electrical reference voltage corresponding to the speed limit from the information received;
a capacitor used as a memory for storing the value of the electrical reference voltage applied to the terminals of this capacitor;
means for updating the voltage at the terminal of the capacitor comprising: a device for short-circuiting the terminals of the capacitor when the vehicle enters the field of transmission of the information in response to the first square wave pulse received, whereby the capacitor is discharged, the device being deactivated during succeeding square wave pulses;
a switching device provided for closing during a succeeding square wave pulse, the switching device connecting an auxillary voltage source through a load resistor to the capacitor whereby the voltage at the terminals of the capacitor is related to the width of the succeeding square wave pulse, the switching device opening at the end of the succeeding square wave pulse whereby the capacitor is isolated from the auxillary voltage source, and
means for controlling the speed of the vehicle in response to the voltage across said capacitor whereby the speed of the vehicle is maintained equal to the speed limit over the stretch of road concerned.

4,216,521
COMPOSITE GROUNDABLE BARRIER FOR SWITCHGEAR

Carl R. Merola, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 26, 1979, Ser. No. 6,833
Int. Cl.[2] H02B *1/04*
U.S. Cl. 361—345 12 Claims

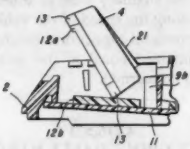


1. Electrical apparatus, comprising:
(a) support means;
(b) a stationary electrical contact disposed on said support means in a disposition to be contacted only from a point within a limited three-dimensional angular range;
(c) movable electrical contact means for being selectively disposed in a disposition of engagement with said stationary contact means or not, said engagement coming from a point within said range;
(d) movable composite barrier means movably disposed upon said support means for being actuated to a first position to insulate said stationary contact from any point within said range when said movable contact means is not in a disposition of engagement with said contact, and for being actuated to a second position to allow said engagement of said stationary contact with said movable contact means, said composite barrier means comprising electrically insulating material for that portion thereof which is closest to said stationary contact when said barrier means is in said first position and electrically conducting material which is spaced from said stationary contact by said insulating material, said electrically conducting material being grounded when said barrier means is in said first position to thus interpose the electrical potential of ground between said stationary contact and any point in said range, said electrically conducting material being ungrounded when said barrier means is in said second position to thus reduce the tendency to interact electrically with said engaged stationary contact and said movable contact means;
(e) actuating means for moving said barrier means; and
(f) grounding means for grounding said conducting material when said barrier means is in said first position.

4,216,522
INTERCHANGEABLE MODULE FOR INTEGRATED CIRCUITS

Gary A. Slagel, Richardson, and Peter L. Bonfield, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 6, 1977, Ser. No. 803,507
Int. Cl.² H05K 5/00
U.S. Cl. 361—392 **7 Claims**

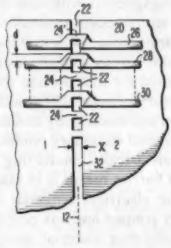


1. An interchangeable modular integrated circuit system for an electronic calculator device or the like comprising:
(a) a module having a body with an integrated circuit disposed in a chamber within said body and a first plurality of contacts disposed in said chamber, said contacts being accessable from the exterior of said module via at least one aperture in said body and coupled in an electrically conductive path to said integrated circuit;
(b) a receptacle located in said device for receiving said module, said receptacle including a second plurality of contacts adapted to engage said first plurality of contacts through said at least one aperture when said module is installed in said receptacle, said receptacle including guide means for facilitating the insertion of said module therein; and
(c) said module having a pair of slots extending partially along the length of two edges thereof, each of said slot engaging a respective guide means and said receptacle for locating said module in said receptacle, the non-slotted portions of said edges providing spacer means for preventing contact between said first and second plurality of electrical contacts until said module is properly located within said receptacle.

4,216,523
MODULAR PRINTED CIRCUIT BOARD

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,994
Int. Cl.² H05K 1/04
U.S. Cl. 361—393 **8 Claims**

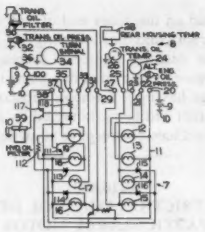


1. A printed circuit board comprising:
an electrically insulating printed circuit substrate,
at least on electrically conductive path on at least one side of said substrate,
at least one notch formed in said substrate for weakening said substrate along a continuous path dividing said substrate into at least first and second sections, said notch being formed such that said first and second sections can be separated by fracturing the substrate at said notch, said one conductive path passing from said first to said second section on said substrate whereby said fracturing separates said conductive path having a portion on each said section,
a first set of circuit elements on said first section for performing a first electrical function, and a second set of circuit elements on said second section for performing a second electrical function,
said first and second set of elements being electrically and operatively interconnected by said at least one electrically conductive path to form an electrical system in which the elements interact with one another in the performance of their functions.

4,216,524
INDICATOR LIGHTS

James E. Leveraus, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 744,130, Nov. 22, 1976, abandoned. This application Sep. 26, 1978, Ser. No. 945,872
Int. Cl.² B60Q 1/00
U.S. Cl. 362—61 **10 Claims**

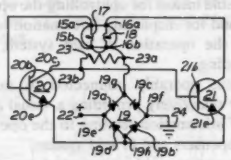


1. A lighting assembly on an instrument panel of a tractor comprising, an instrument panel including a plurality of windows defining a panel surface mounted for facing an operator station, compartment means integral with said instrument panel defining a plurality of compartments extending from said panel surface into said instrument panel, each one window of said plurality of windows forming a portion of said panel surface of said instrument panel covering an end of one of said compartments, each window including a different indicator with each for indicating one of the conditions sensed in the tractor, a removable circuit board removably mounted on said compartment means, an electrical indicator lighting circuit supported on said circuit board including, a light bulb testing circuit in said electrical indicator lighting circuit for indicating operativeness of light bulbs in said circuit when a test switch is closed, a plurality of light bulbs each indicating a sensed condition and having a base mounted on said circuit board in said electrical indicator lighting circuit with each one of said light bulbs extending into one of said plurality of compartments, a resilient reflector mounted on said circuit board and engaging the inner end of said compartment means, a reflecting surface including a portion on the end of each compartment for reflecting light through the window of the compartment when the bulb in the compartment is lighted, means removably fastening said circuit board and compressively retaining said reflector between said compartment means and said circuit board, a sensory circuit sensing a plurality of conditions on said tractor, a cable extending into said instrument panel and a connector removably connecting said sensory circuit to said electrical indicator lighting circuit for lighting bulbs in response to the sensed conditions.

4,216,525
TRUCK MARKER LIGHT

Joseph Spiteri, P.O. Box 158, Harborcreek, Pa. 16421

Continuation-in-part of Ser. No. 742,220, Nov. 16, 1978, Pat. No. 4,128,860. This application Oct. 11, 1978, Ser. No. 950,475
The portion of the term of his patent subsequent to Dec. 5, 1995, has been disclaimed.
Int. Cl.[2] B60Q *1/26*
U.S. Cl. 362—80 3 Claims



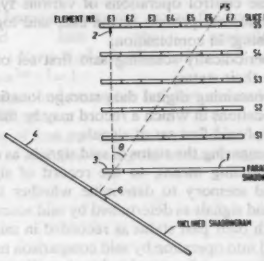
1. A marker light for trucks, semi-trailers and the like having electrical systems with either positive or negative ground comprising a base having means for mounting the same on a truck, a lens mounted on the base, lamp means having first and second filaments, lamp supporting means, means for mounting the lamp supporting means on the base, said lamp supporting means having means for receiving said lamp means, a ground terminal adapted to be connected to the truck electrical system ground, a power terminal adapted to be connected to the live terminal of the truck electrical system, a first transistor, a second transistor, a full wave bridge rectifier having its input connected across said power and ground terminals and having its output connected in series through the base and emitter of said first transistor to the first filament and also having its output connected in series through the collector and emitter of said second transistor to the second filament, a connection from the collector of the first transistor to the base of the second transistor for biasing the second transistor off only while the first transistor is on and current is flowing throught the first transistor as would be the case when the first filament is unbroken, and a bias resistor connected to the base of the second transistor for biasing said second transistor on, the bias from said resistor being overcome by the bias from said first transistor when said first transistor is on and conducting current through the first filament.

4,216,526
ORGANIZATION OF TOMOGRAPHIC DATA FOR A TWO DIMENSIONAL DISPLAY

Wieslaw A. Karwowski, Perivale, England, assignor to E M I Limited, Hayes, England

Filed Jan. 16, 1978, Ser. No. 869,471
Claims priority, application United Kingdom, Feb. 2, 1977, 4279/77
Int. Cl.[2] A61B *6/00*
U.S. Cl. 364—414 12 Claims

1. An apparatus for processing, for display, values of a quantity, for example, X-ray absortion, measured in a region of the body of a patient, the apparatus including: storage means for receiving data signals representing the measured values for respective elemental areas of a plurality of cross-sectional slices of the body, each data signal being identified by the co-ordinates of the respective element in the body according to a first co-ordinate system; transformation means coupled with said storage means for transforming the co-ordinates for the data signals received by said storage means to the co-ordinates for the same elements according to a second co-ordinate system, in two dimensions orthogonal to a selected direction in the body; and means coupled with said storage means for summing, for the plurality of slices, data signals received by said storage means which are identified by substantially the same co-ordinates in the second system, to thereby provide a

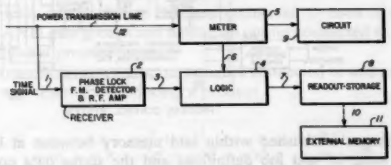


representation which is the sum of the individual slices viewed in the selected direction.

4,216,527
SYSTEM FOR METERING ELECTRICAL ENERGY WITH REMOTE TIME SIGNAL CORRELATION

Paul J. Emerson, Scottsdale, and Walter P. Hedges, Laveen, both of Ariz., assignors to Cyborex Laboratories, Inc., Phoenix, Ariz.

Filed Jun. 9, 1978, Ser. No. 914,029
Int. Cl.[2] G01R *21/06;* G06F *15/20*
U.S. Cl. 364—483 6 Claims



1. In a system for metering the electrical energy consumption in each of a plurality of separate circuits and correlating said energy consumption with time, including in each of said separate circuits

meter means for sensing the electrical energy consumption in each said circuit and for generating signals in response thereto,

timing means for generating time signals, and

logic means in each of said circuits for correlating said energy consumption signals and said time signals,

the improvements comprising:

receiver--logic means in each of said plurality of separate circuits for receiving a common actual time signal generated at and transmitted from a location remote from said circuits, and for separately correlating said time signal with said electrical energy consumption signals for each of said circuits to provide correlated time-current data for each of said separate circuits.

4,216,528
DIGITAL COMPUTER IMPLEMENTATION OF A LOGIC DIRECTOR OR SEQUENCER

James D. Robertson, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 3, 1972, Ser. No. 277,486
Int. Cl.[2] B21B *37/00*
U.S. Cl. 364—468 7 Claims

5. A logic director system for use in controlling the occurrence of sequential control actions in an industrial process or the like, said logic director system receiving as inputs at least a first set of binary signals with respective "1" or "0" states

indicating the current status of the industrial process or the like and which supplies to said industrial process or the like at least a second set of binary output control signals whose "1" and "0" states cause control operations of various types to take place in said industrial process or the like, said logic director system comprising, in combination:

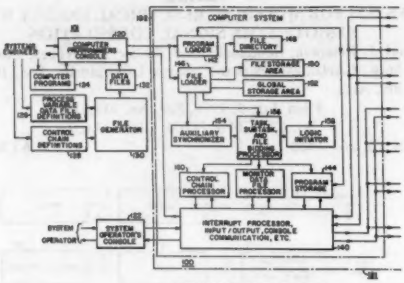
means for periodically scanning said first set of signals to determine their status;

a memory containing digital data storage locations and including locations in which a record may be maintained of the status of said first set of signals;

means for comparing the status of said signals, as determined by said scanning means, to the record of signal status within said memory to determine whether the present status of said signals as determined by said scanning means agrees with their past status as recorded in said memory;

means placed into operation by said comparison means when the present status of a signal is found to disagree with its past status for altering the status data of said signal in said memory to correspond with the actual status of said signal;

a plurality of executable job definitions within said memory;



linkages established within said memory between at least some of said job definitions and the status data corresponding to at least some of the signals in said first set of signals;

means for generating said second set of output control signals;

means for executing the commands contained in a job definition, including means responsive to commands in a job definition for causing said signal generating means to adjust the status of the control signals in said second set under the control of the job definition, whereby said job definitions may cause control actions to be carried out in said industrial process or the like through adjustment of said control signals;

means placed into operation by said comparison means when the present status of a signal is found to disagree with its past status for following any linkages from the status data corresponding to that signal to any job definitions which may be linked to that signal, and also means for supplying these job definitions to said means for executing;

whereby all job definitions linked to a signal are executed each time the signal fluctuates.

4,216,529

FLUID DISPENSING CONTROL SYSTEM

Michael S. Krystek, Spring Valley; George L. Hurley, III, Alpine; Steven R. Smith, San Diego, and Stephen E. Rice, Del Mar, all of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jan. 17, 1978, Ser. No. 870,187
Int. Cl.[2] G06F *15/56*
U.S. Cl. 364—510 **20 Claims**

1. A system for monitoring and controlling the operation of a plurality of dispensers for dispensing a fluid such as gasoline or the like, said dispensers having electrically actuable flow control means and means for metering the flow of fluid being dispensed, comprising:

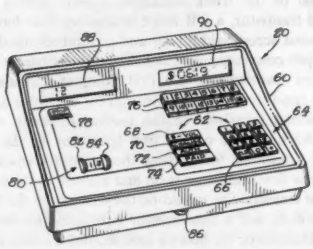
processing means for carrying out operations under the direction of operating programs, said processing means including memory means for storing information relating to the data generated during operation of said dispensers and for storing program information for operating the processing means;

operating console means for controlling the operation of said dispensers and for displaying information to the operator relative to the operation of said system, said console means including

display means operably connected to said processing means for selectively providing a visual alpha-numeric display of information relating to the operation of each of said dispensers and of said system,

keyboard means operably connected to said processing means for inputting functional and numeric information relating to transactional operations concerning said dispensers,

means operably connected to said processing means for selecting a dispenser of interest, the selection of a dispenser enabling transactional operations to be carried out by said selected dispenser and said display means to display information relating to the transactional operations of said selected dispenser, provided said system is in a one of certain selected operating modes;



means operably connected to said processing means for selecting one of a plurality of operating modes of said system, each mode selected calling predetermined operating programs from said memory means for directing said processing means;

means operatively connected to the flow metering means for generating electrical signals indicative of the volume of fluid flowing therethrough, said electrical signals being forwarded to said processing means;

means operatively connected to the flow control means of each dispenser for operating the same to selectively enable and disable flow through the dispenser in response to receiving electrical signals from said processing means; and

switching means for providing signals to said processing means that selectively enable and disable transactional operations in certain of said operating modes, said switching means providing signals to said processing means for activating an access selecting mode, the selection of said access selecting mode by said operating mode selecting means together with operation of said switching means permitting the selecting and selective enabling of operating modes by said keyboard means wherein all transactional operations of a mode that has been selected and enabled can be carried out without operating said switching means.

4,216,530
NAVIGATION INSTRUMENT FOR ROADWAY VEHICLES

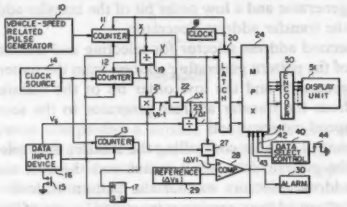
Kiyoshi Yamaki, Yokohama; Masanori Mizote, Yokosuka; Takashi Oka, Toyko; Hideoki Matsuoka, Yokohama; Hiroyuki Nomura, Yokohama; Takaaki Mogi, Yokohama, and Akitoshi Mimura, Tokorozawa, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 28, 1978, Ser. No. 973,903

Claims priority, application Japan, Jan. 10, 1978, 53-1366; Jan. 11, 1978, 53-1679; Jan. 11, 1978, 53-1681

Int. Cl.[2] G01P *3/56*; G01C *23/00*

U.S. Cl. 364—565 **7 Claims**



1. A navigation instrument for roadway vehicles comprising:

means for generating an actual distance signal representing a distance travelled from a starting point of a journey;

means for generating an elapsed time signal representing the length of time elapsed from said starting point;

at least two of first, second and third means, said first means including means for arithmetically dividing said actual distance signal by said elapsed time signal to generate an average speed signal representing the average speed of said vehicle over said distance travelled from said starting point; said second means including means for generating a constant speed reference signal representing an estimated average vehicle speed, means for arithmetcially multiplying said constant speed reference signal with said elapsed time signal to generate a distance reference signal representing an estimated distance from said starting point, and means for arithmetically subtracting said actual distance signal from said distance reference signal to generate a distance deviation signal representing the deviation of said distance travelled from said starting point from said estimated distance; and said third means including means for generating a time deviation signal representing the deviation of said length of time elapsed from said starting point from an estimated length of time from said starting point; and

means for visually indicating at least two of said average speed signal, said distance deviation signal and said time deviation signal.

4,216,531
FINITE FIELD MULTIPLIER

Sou-Hsiung J. Chiu, Eagan, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 17, 1978, Ser. No. 961,801

Int. Cl.[2] G06F *7/52*

U.S. Cl. 364—757 **1 Claim**

1. A finite field multiplier for forming the product of two operands A and B expressed as a plurality of binary bits, where each operand is of the same length and wherein the relationship 2^m-1 is divisible to form an integer by m+1 wherein m is the number of bits in said operands, wherein said multiplier comprises,

means for receiving an A operand of the form $A=a_0+a_1x+a_2x^2+a_3x^3+\ldots+a_{m-1}x^{m-1}$

means for receiving a B operand of the form $B=b_0+b_1x+b_2x^2+b_3x^3+\ldots+b_{m-1}x^{m-1}$

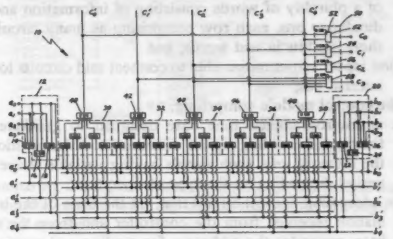
a first transpose network means for transforming the A operand into the equivalent form $A'=a'_0+a'_1r+a'_2r^2+a'_3r^3+a'_4r^4+\ldots+a'_mr^m$ where $r^{m+1}=x^{2m-1}=1$

wherein said first transpose network means is comprised of Exclusive OR gates,

a second transpose network means for transforming the B operand into the equivalent form $B'=b'_0+b'_1r+b'_2r^2+b'_3r^3+b'_4r^4+\ldots+b'_mr^m$ where $r^{m+1}=x^{2m-1}=1$

wherein said second transpose network means is comprised of Exclusive OR gates,

a plurality of first multiplier busses connected to receive the output of said first transpose network means,



a plurality of second multiplier busses connected to receive the output of said second transpose network means,

a plurality of AND gate groups connected in array form to said first and second plurality of multiplier busses,

a plurality of product busses,

at least one Exclusive OR gate connected to each of said AND gate groups and having an output connected to one of said product busses,

an output inverse transpose network connected to said product busses for producing a product

$$C = c_0 + c_1x + c_2x^2 + c_3x^3 + \ldots + c_{m-1}x^{m-1}$$
$$= c_0' + c_1'r + c_2'r^2 + c_3'r^3 + c_4'r^4 + \ldots + c_m'r^m$$

wherein said inverse transpose network is comprised of Exclusive OR gates and the resultant product is a sequence of m bits.

4,216,532
SELF-CORRECTING SOLID-STATE MASS MEMORY ORGANIZED BY WORDS FOR A STORED-PROGRAM CONTROL SYSTEM

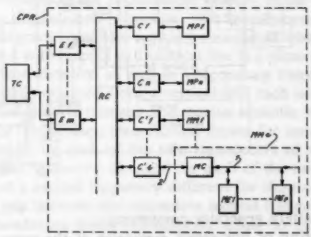
Enzo Garetti, and Renato Manfreddi, both of Turin, Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Mar. 2, 1979, Ser. No. 17,037

Claims priority, application Italy, Mar. 9, 1978, 67499 A/78

Int. Cl.[2] G11C *13/00*

U.S. Cl. 365—182 **10 Claims**



1. A self-correcting, solid-state mass memory, organized in

words for a stored-program control system wherein a processor is interfaced towards the mass memory through a controller, said mass memory including at least one memory module, a control module and a bidirectional internal bus connecting the control module to each memory module, said memory module comprising:

at least one row of integrated memory circuits realized by charge-coupled technology and consisting of blocks of shift registers organized in serial-parallel-serial configuration, each block being able to be addressed randomly and at the same time as the blocks of equal position in all the circuits of the row and containing a plurality of cells that can be sequentially addressed, each circuit storing a bit out of a plurality of words consisting of information and redundancy bits, each row comprising as many circuits as there are bits in said words; and

first input/output means able to connect said circuits to said internal bus;

the control module comprising:

a microprogrammed time base designed to generate the timing and enabling signals necessary to the operation of the memory unit, such signals having variable shape and period depending on the type of operation;

an addressing control circuit that, on the basis of the information received from the controller and from the time base, generates the addresses for reading and writing in the memory module and memory circuits;

second input/output means designed to connect said control module to the internal bus and distribute the data towards the memory module or towards the controller; and

a self-correcting logic able to generate the redundancy bits on the basis of the information bits and to control, by using said redundancy bits, the good operation of the memory moduie and to correct possible memory errors.

4,216,533

PATTERN GENERATOR

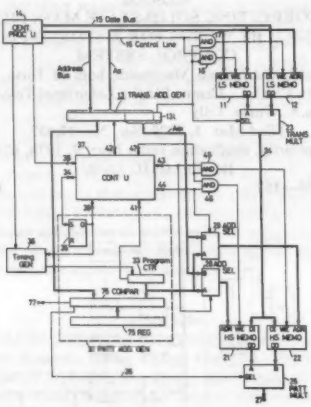
Yoshichika Ichimiya, Tokorozawa; Tsuneta Sudo, Kodaira, and Katsumi Shimada, Fukiage, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Takeda Riken Kogyo Kabushikikaisha, both of, Japan

Filed Mar. 23, 1979, Ser. No. 23,458

Claims priority, application Japan, Mar. 29, 1978, 53/37006

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—230 **10 Claims**



1. A pattern generator comprising:

a plurality of low-speed memories of the same operating speed, each having stored therein a plurality of patterns;

first and second high-speed memories of higher operating speed than the low-speed memories and of the same storage capacity;

pattern data select means connected between the plurality of low-speed memories and the first and second high-speed memories to select and transfer one of data simultaneously read out of the low-speed memories as write data to the first and second high-speed memories;

a pattern address generator for producing a pattern generating address;

a transfer address generator for generating a transfer address;

a first address selector for selecting and transferring one of the pattern generating address from the pattern address generator and a low order bit of the transfer address from the transfer address generator;

a second address selector for selecting and transferring one of the pattern generating address from the pattern address generator and the low order bit of the transfer address from the transfer address generator to the second high-speed memory; and

a control unit for controlling the transfer data select means, the pattern data select means and the first and second address selectors so that the pattern address from the pattern address generator is applied to one of the first and second high-speed memories to read out thereof data and output them as output patterns from the pattern data select means and that the transfer address from the transfer address generator is applied to all of the low-speed memories to read out thereof data and the low order bits of the transfer address are applied to the other of the first and second high-speed memories to successively write therein the data read out of the low-speed memories via the transfer select means, and that upon completion of reading of the said one high speed memory, the low order bits of transfer address are applied to the said one high speed memory to write therein the data read out fo the low speed memories and, at the same time, the pattern address is applied to the other high speed memory to read out thereof data and output them as output patterns from the pattern data select means.

4,216,534

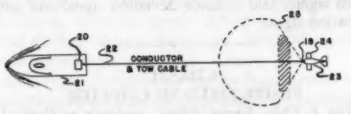
DECOYING ACOUSTIC HOMING TORPEDOES

William E. Wells, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 28, 1960, Ser. No. 39,413

Int. Cl.[2] H04K *3/00*

U.S. Cl. 367—1 **2 Claims**



1. Apparatus for protecting a pelagic vessel from attack by acoustic homing torpedoes comprising a vehicle to be towed submerged a substantial distance behind said vessel, an electroacoustic transducer mounted in said vehicle and having a forwardly directed directivity pattern, a source of constant amplitude oscillating electrical wave energy, means for modulating the oscillating frequency of said wave energy cyclically over a range inclusive of the operating frequencies of such torpedoes and at a linear rate slow enough to satisfy the energy requirement in the band pass of passive torpedo circuits and fast enough to satisfy the rise time of active torpedo discriminator circuits, and means for energizing said transducer with the modulated wave energy from said source.

4,216,535
SYSTEM FOR DEPLOYING A MOORED SENSOR ARRAY

Derek J. Bennett, Thousand Oaks, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Mar. 20, 1978, Ser. No. 888,019
Int. Cl.[2] H04B 1/59
U.S. Cl. 367—4 10 Claims

1. A system comprising a surface buoy, cable and sensor array for deploying said sensor array from a mooring weight on the ocean floor, said cable being connected at its upper end to said surface buoy, and at its lower end to said mooring weight, said system further comprising a container for said array and cable, said container having a hollow elongated body weighted at one end, thereby to descend to the ocean floor at an acute glide angle from the horizontal and to carry said array while paying out said cable, said acute glide angle establishing a glide path greater than the vertical distance from said surface buoy to said ocean floor, thereby to pay out cable of sufficient scope to withstand dynamic effects of waves and currents on said surface buoy once said container reaches the ocean floor, said container further having means for locking the lower end of payed out cable to said container, means for ejecting said array from said container, upon said container reaching the ocean floor, and means for connecting said array to said container whereby said container functions as the mooring weight on the ocean floor for said array.

7. A system for deploying a hydrophone array moored to the ocean floor and connected to a surface buoy by a cable extending from the ocean floor to said surface buoy, comprising a container dropped into the water to descend to the ocean floor, said container having a hollow cylindrical shape closed at one end by a mass, said container having stored within it a package containing said array, a pack of said cable and said surface buoy, said cable being connected at one end to said surface buoy, and the other end to said container and said array, said container being open at its end opposite the closed end to permit said surface buoy to be ejected upon entering the water, and to permit the cable to be payed out while said container descends to the ocean floor, and means for ejecting said array package from said container upon impact of the container with the ocean floor.

4,216,536
TRANSMITTING WELL LOGGING DATA

Henry S. More, Carmichael, Calif., assignor to Exploration Logging, Inc., Sacramento, Calif.

Filed Oct. 10, 1978, Ser. No. 949,903
Int. Cl.[2] G01V 1/40, 1/22
U.S. Cl. 367—83 16 Claims

1. A method for verifying data transmitted from a downhole location in a well to the surface of the earth, the method comprising the steps of:

generating the data at the downhole location;

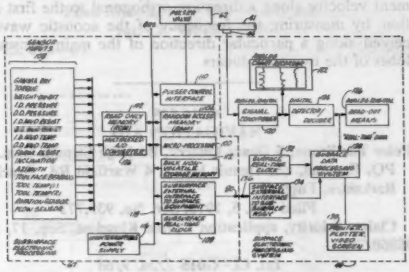
storing the data in a subsurface assembly in the well;

transmitting signals corresponding to the data to the surface through a first transmission system while keeping the data stored in the subsurface assembly;

recording the signals transmitted to the surface through the first transmission system;

thereafter transferring the subsurface assembly to the surface;

transmitting signals corresponding to the stored data through a second transmission system from the assembly to an electronic processing system; and

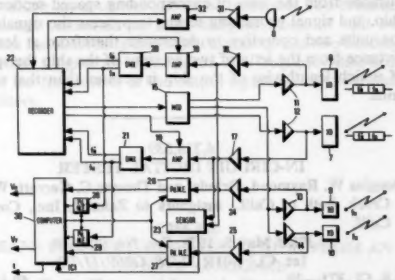


comparing the signals transmitted through the second transmission system with the signals transmitted through the first system.

4,216,537
SONAR FOR THE TOPOGRAPHIC REPRESENTATION OF A SUBMERGED SURFACE AND UNDERLYING STRATA

Robert Delignieres, Mareil Marly, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 19, 1978, Ser. No. 970,901
Claims priority, application France, Dec. 20, 1977, 77 38723; Jul. 10, 1978, 78 20750
Int. Cl.[2] G01S 9/68
U.S. Cl. 367—88 20 Claims



9. A device of the sonar type, placed on the vehicle displacable with respect to a submerged surface, comprising acoustic means for determining the displacement velocity of the vehicle along a first displacement direction, two transducers whose directivity diagram comprises a main transmission lobe whose axis is inclined with respect to a vertical line in a plane orthogonal to the first direction as well as a secondary transmission lobe substantially oriented along a vertical line, each said transducer being adapted to transmit and receive acoustic waves at two different frequencies, transmission means for controlling the transmission by each of the two transducers of acoustic pulses at a first frequency identical for each of the two transducers and at a second frequency different for the two transducers, the gap between the respective second frequencies of the two transducers being substantially equal to twice the passing band of the transducers, a sensor whose axis is oriented substantially along a vertical line and adapted to receive the echoes of parametric waves resulting from the combination of

pulses of different frequencies and reception means for generating, from echoes of the pulses transmitted by the transducers, echograms of the submerged surface, laterally with respect to the first direction of displacement of the vehicle, to determine the water depth below the vehicle, by measuring the propagation time of the waves transmitted along the directions of the secondary transmission lobes and for calculating its displacement velocity along a direction orthogonal to the first direction, by measuring the frequency of the acoustic waves received along a particular direction of the main transmission lobes of the two transducers.

4,216,538

NAVIGATION AID

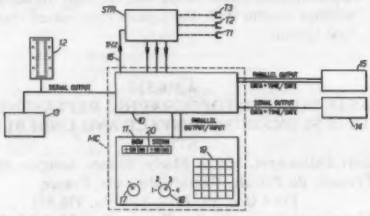
Peter Tomlinson, 5 Deans Quarry, Burleigh Stroud, Glos. GL5 PQ, England, and Dennis Healy, 4 Warfield Rd., Bracknell, Berkshire, England

Filed Sep. 5, 1978, Ser. No. 939,772

Claims priority, application United Kingdom, Sep. 17, 1977, 38850/77

Int. Cl.[2] G01S *7/54, 9/68*

U.S. Cl. 367—89 **9 Claims**



1. A navigation aid for determining berthing data comprising two distance detecting units spaced apart along the length of a jetty and operative to provide signals indicative of the distance from the jetty of corresponding spaced sections of a ship, and signal processing means to process the signals from the units and operative to determine therefrom at least the distance from the jetty of two sections of the ship the spacing of which lengthwise of the ship is greater than that of said units.

4,216,539

IN-CIRCUIT DIGITAL TESTER

Douglas W. Raymond, Orinda, and Thomas C. Garrett, Walnut Creek, both of Calif., assignors to Zehntel, Inc., Concord, Calif.

Filed May 5, 1978, Ser. No. 903,160

Int. Cl.[2] G01R *31/28;* G06F *11/00*

U.S. Cl. 371—20 **60 Claims**

1. Apparatus for the in-circuit testing of the electrical properties of components of a circuit, comprising:

(a) a central processing unit for controlling the tests to be performed and for interpreting the results of said tests;

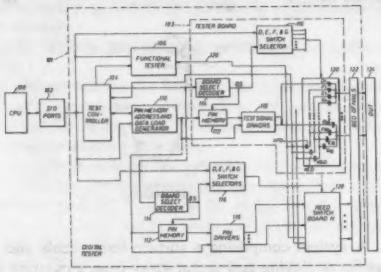
(b) electrical test pins, contactable with electrical nodes in said circuit;

(c) sets of selectable switches, one set associated with each of said test pins, for connecting each of said test pins to at least one of a plurality of signal lines associated with each said pin, said signal lines including a response signal line;

(d) a plurality of digital test-signal generators, each of said generators being associated with one of said test pins, for generating at least one digital test signal from a set of test signals, the output line from each of said generators comprising one of the plurality of signal lines for the test pin associated with said generator;

(e) switch-selecting means responsive to the central processor, for selecting at least one of said selectable switches, to connect selected ones of said test pins to their associated plurality of signal lines, thereby to connect one of said plurality of digital test-signal generators to one of the nodes of the circuit, and to connect a node of the circuit to the response signal line;

(f) a test controller responsive to the central processor, for generating a test cycle wherein said digital test-signal



generators supply test signals to said circuit, thereby to cause the circuit to produce a response signal on said response signal line; and

(g) a functional tester responsive to the central processor, for testing the signal on said response signal line, to determine electrical properties of said circuit.

4,216,540

PROGRAMMABLE POLYNOMIAL GENERATOR

Jeff R. McSpadden, Isanti, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 9, 1978, Ser. No. 959,290

Int. Cl.[2] G06F *11/12*

U.S. Cl. 371—37 **4 Claims**

1. A programmable polynomial generator for use in error correction systems comprising:

means for receiving a plurality of polynomial enable input signals representing an input polynomial,

means for receiving input data signals representing bits of an input operand,

a data input multiplexer connected to said means for receiving input data signals for selectively multiplexing said signals in a particular pattern from a predetermined number of patterns,

a plurality of polynomial enable gates adapted to respond to at least one control signal, said each of gates being connected to said means for receiving a plurality of polynomial enable input signals

a plurality of check character generating gates, each of said gates being connected to receive signals from said data input multiplexer and from an associated one of said polynomial enable gates,

a holding register adapted to respond to at least one control signal connected for receiving signals from each of said plurality of check character generating gates,

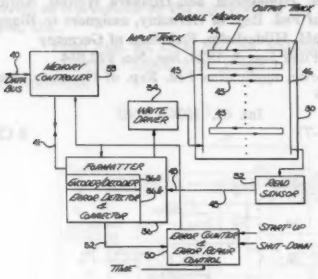
a first decode gate connected to the output signals of said holding register to provide a decode signal if the contents of said register is all zero, and

a second decode gate connected to receive output signals from said holding register to provide a decode signal if the contents of said register are a predetermined quantity.

4,216,541
ERROR REPAIRING METHOD AND APPARATUS FOR BUBBLE MEMORIES

Richmond B. Clover, Sunnyvale, and George J. Miller, San Jose, both of Calif., assignors to Intel Magnetics Inc. and Intel Corporation, both of Santa Clara, Calif.

Filed Oct. 5, 1978, Ser. No. 948,666
Int. Cl.[2] G06F *11/12*; G11C *29/00*
U.S. Cl. 371—38 3 Claims



1. In a magnetic bubble memory system which includes a magnetic memory device for storing data in the form of magnetic bubbles and writing means and reading means for writing data into said device and for reading data from said device, an improvement for detecting and correcting errors in data stored in said memory system comprising:

encoding means for receiving data to be stored in said memory and for encoding said data with an error correcting code to provide coded data, said encoding means coupled to said writing means;

error detection and correction means for examining said coded data to determine if an error is present in said coded data and for correcting said error, said error detection and correction means coupled to said reading means for receiving coded data and coupled to said writing means for rewriting said coded data into said device, said error detection and correction means comprising:

a first register for receiving blocks of said coded data;

a second register comprising a plurality of stages, each of which includes a bi-stable circuit;

a multiplexer coupled to receive the output of said first register and the output of said second register;

first logic means for generating a plurality of logic signals for said second register, said logic means coupled to receive said coded data, said plurality of logic signals being coupled to stages of said second register;

detection means coupled to said stages of said second register for detecting the binary state of signals in said second register;

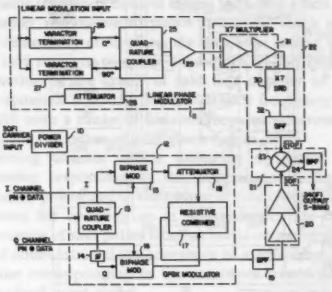
second logic means for correcting errors in said data, coupled to the output of said multiplexer and coupled to receive signals from said second register, said second logic means coupled to said detection means for enabling said correction upon the detection by said detection means of predetermined binary state of said signals in said second register;

whereby errors in said coded data are detected and corrected.

4,216,542
METHOD AND APPARATUS FOR QUADRIPHASE-SHIFT-KEY AND LINEAR PHASE MODULATION

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Charles E. Hermesmeyer, Scottsdale, Ariz.

Filed Mar. 6, 1979, Ser. No. 17,890
Int. Cl.[2] H04L *27/18*
U.S. Cl. 375—67 5 Claims



4. In a system for selective QPSK modulation and linear phase modulation of a carrier that is a submultiple of an S-band transmitter output frequency, the combination of two parallel modulation branches, a first branch for QPSK modulation, said first branch including a QPSK modulator and a bandpass filter for said submultiple at the output of said QPSK modulator, and a second branch for linear phase modulation, said second branch including a linear phase modulator, a multiplier for multiplying said submultiple by a factor which is one less than required to increase said carrier to said output frequency, and a bandpass filter for said multiplied subcarrier, means for dividing available input carrier power between said two branches, and means connected to said bandpass filters of said two branches for combining the output signals of said two bandpass filters into a signal for transmission at a frequency that is the sum of the frequencies of the output signals of said two bandpass filters.

4,216,543
MEANS FOR DERIVING BAUD TIMING FROM AN AVAILABLE AC SIGNAL

George C. Cagle, Plano, and Roger A. Bloom, Garland, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 26, 1979, Ser. No. 15,014
Int. Cl.[3] H04L *27/32*; H03D *3/22*
U.S. Cl. 375—95 19 Claims

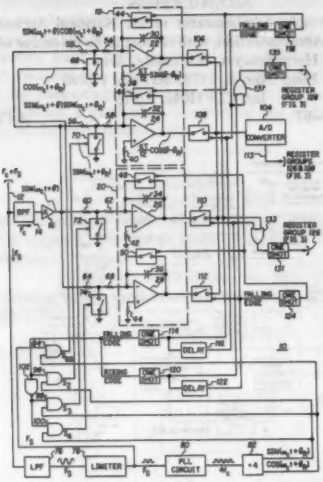
1. Means for providing a baud timing signal from an AC signal having n half-cycles during each baud period, for use in demodulating a carrier signal bearing digital information via some predetermined variation in a characteristic of the carrier signal during each baud period, comprising:

means for converting the carrier signal characteristic variation to a DC signal indicative of the digital data;

means for sampling the DC signal at the same point during each half-cycle of the AC signal;

means for summing the samples corresponding to the same half-cycle of the AC signal within each sequence of AC signal half-cycles occurring over successive baud periods, there being n such samples totals;

means for identifying the largest one of said n samples totals, and



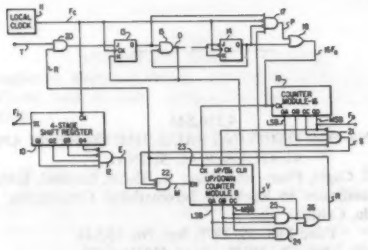
means for synchronizing the baud timing signal to the AC half-cycle yielding said largest samples total.

4,216,544

DIGITAL CLOCK RECOVERY CIRCUIT

Alberto Boleda, Menlo Park, and John F. Wakerly, Palo Alto, both of Calif., assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 19, 1978, Ser. No. 943,744
Int. Cl.[2] H04L *7/02, 25/40*
U.S. Cl. 375—119 **6 Claims**



1. A clock recovery circuit for a digital transmission system, comprising:

a local clock having a nominal repetition rate greater than the pulse rate of a received digital signal;

a divider circuit responsive to the local clock and a gating circuit for providing a recovered clock signal at its output;

the gating circuit detecting the relative phase of the recovered clock signal and a detected transition of the received digital signal for generating control signals which advance or delay the divider circuit to maintain the average repetition rate of the recovered clock signal equal to said pulse rate of the received digital signal;

characterized by:

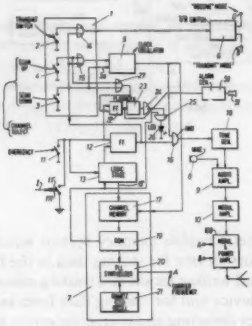
a further gating circuit responsive to a selected output count from the divider circuit for inhibiting said gating circuit to prevent said advance or delay of the divider circuit during the interval of said selected output count.

4,216,545

METHOD AND APPARATUS OF COMMUNICATING EMERGENCY SIGNALS FROM A TRANSCEIVER IN A TRANSCEIVER COMMUNICATION NETWORK, PARTICULARLY FOR CITIZEN-BAND EMERGENCY USE

Peter Flickshu, Hildesheim, and Diethard Wenzel, Nordstemmen, both of Fed. Rep. of Germany, assignors to Blaupunkt Werke GmbH, Hildesheim, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 912,044
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1977, 2726865
Int. Cl.[2] H04B *1/40*
U.S. Cl. 455—77 **8 Claims**



1. For use in a radio communication network,

a transceiver operable in a predetermined number of communication channels (1–40) of respectively different predetermined frequencies, in which one of the channels is an emergency channel (Ch. 9) for transmission of emergency information, comprising

a transmitter circuit (**100**);

a transmit/receive switch means (**6**) controlling the mode of operation of the transceiver;

modulating means (**18**) generating an emergency signal;

an emergency switch means (**11, 11'**);

a clock source (**5**) generating a sequence of clock signals;

control switch means (**12**) controlled by said emergency switch means (**11, 11'**) and controlling

(a-1) said transmit/receive switch means (**6**) to place the transceiver in "transmit" mode, and

(b-1) the clock source (**5**) to supply clock signals;

frequency generating means (**7; 17, 19, 20, 21**) capable of generating said respective predetermined frequencies, connected to and controlled by said clock source (**5**) to temporally sequentially generate said frequencies as controlled by sequential clock signals from said clock source, said modulating means (**18**) modulating the respective frequencies being generated for transmission by said transceiver in the transmit mode and thereby transmit on said channels, temporally, sequentially, said emergency signal;

logic means (**13**) connected to said frequency generating means and determining when the frequency of the emergency channel (Ch. 9) is being generated by said frequency generating means as it temporally sequentially changes the frequency under control of said clock source (**5**), said logic means controlling said control switch means (**12**) to

(a2) control the transmit/receive switch means (6) to place the transceiver in the "receive" mode, and

(b2) discontinue application of clock signals from said clock source (5) to the frequency generating means, whereby the transceiver will be enabled to receive messages on said emergency channel (9) for other transmitters in the network.

4,216,546

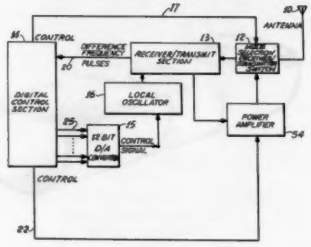
FREQUENCY BANDWIDTH TUNING SYSTEM AND METHOD

Eric S. Litt, Wanamassa, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1978, Ser. No. 933,703

Int. Cl.[2] H04K 3/00; H04B 1/32

U.S. Cl. 455—164 9 Claims



1. A clocked receiving system including a receiver having a controllable oscillator and capable of automatically sensing the frequency at a prespecified position within the bandwidth of a received input signal of frequency unknown at the receiving system, said receiver producing pulses at a difference frequency between said oscillator and said received signal, comprising

clock means for providing a series of clock pulses at a given rate,

clock rate division means responsive to said clock means for providing clock pulses at a reduced rate which is less than said given rate by an amount dependent upon said prespecified position,

oscillator frequency control means including a first up-down counter responsive to pulses from said clock means for incrementally controlling the oscillator tuning frequency of said receiver over the bandwidth of said receiver as a function of the count of said first counter to effect an incremental scanning of the oscillator frequency back and forth over a range of discrete frequency increments during the operation of said clock means,

measuring counter means including a second up-down counter responding to the presence of difference frequency pulses and to the output of said clock rate division means for counting up at said reduced rate during the presence of said pulses from an initial count up to a threshold count attained at occurrence of a difference frequency pulse corresponding to the maximum bandwidth of said received input signal,

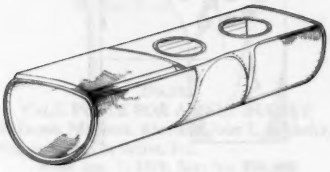
said measuring counter means including a control circuit responsive to cessation of said difference frequency pulses for changing the direction of counting of said first and second counters and for changing the counting rate of said second counter to that of said clock means, and

clock inhibiting means responding to attainment of the initial count by the down-counting second counter for maintaining the incremental frequency count of said first counter and to hold the receiver at said predetermined position within the bandwidth of said received input signal.

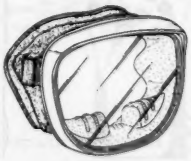
DESIGNS

AUGUST 5, 1980

256,176
ELBOW GUARD
Robert J. Rule, Manhasset, N.Y., assignor to W. H. Brine Company, Needham, Mass.
Filed Jun. 15, 1978, Ser. No. 915,950
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27

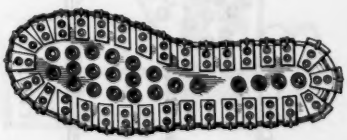


256,177
DIVING MASK
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Dec. 7, 1977, Ser. No. 858,471
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



256,178
BOOT
Pietro L. Rigon, Vicenza, Italy, assignor to Rigon S.p.A., Vicenza, Italy
Filed Jul. 7, 1978, Ser. No. 923,082
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

256,179
SHOE SOLE
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 673,218, Apr. 2, 1976. This application Aug. 12, 1977, Ser. No. 823,962
The portion of the term of this patent subsequent to May 9, 1992, has been disclaimed.
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320



256,180
CLEATED SPORTS SHOE SOLE
Jerome Turner, Pikesville, Md., assignor to Brooks Shoe Manufacturing Co., Inc., Hanover, Pa.
Filed Mar. 6, 1978, Ser. No. 883,625
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

256,181
ABRASIVE MITTEN
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Chicago, Ill.
Filed Apr. 24, 1978, Ser. No. 899,632
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—365

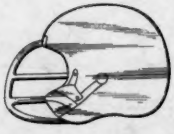
256,182
ABRASIVE MITTEN
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Chicago, Ill.
Filed Apr. 24, 1978, Ser. No. 899,634
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—365

256,183
ABRASIVE GLOVE
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Chicago, Ill.
Filed Apr. 24, 1978, Ser. No. 899,633
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—373

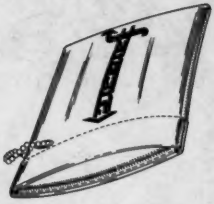
256,184
ABRASIVE GLOVE
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to Rub-A-Venture, Chicago, Ill.
Filed Apr. 24, 1978, Ser. No. 899,635
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—373

256,185
FACE PLATE FOR A BELT BUCKLE
Alfred W. Danat, Madison, Ala., and John L. Schaefer, Alexandria, Va., assignors to Sallet, Inc.
Filed Apr. 7, 1978, Ser. No. 894,600
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—431

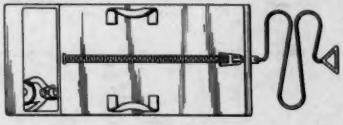
256,186
FACE PLATE FOR A BELT BUCKLE
Alfred W. Danat, Madison, Ala., and John L. Schaefer, Alexandria, Va., assignors to Sallet, Inc.
Filed Apr. 7, 1978, Ser. No. 894,623
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—431



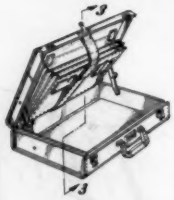
256,187
FARE CARD CASE
Elizabeth B. Miles, 3415 Lowell St. NW., Washington, D.C. 20016
Filed Jan. 18, 1978, Ser. No. 870,496
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—56



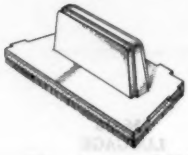
256,188
LUGGAGE
Bette B. Davidson, 303 N. Lancaster Ave., Margate, N.J. 08402
Filed Mar. 17, 1978, Ser. No. 887,518
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—66



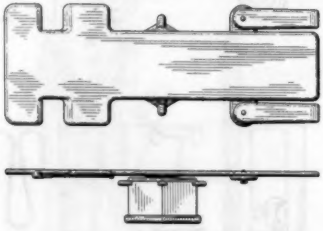
256,189
COMBINED ATTACHE CASE AND DETACHABLE FILE FOLDER
George Rapoport, 8787 Shoreham Dr., Number "C", Los Angeles, Calif. 90057
Filed Jun. 20, 1978, Ser. No. 917,297
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—76



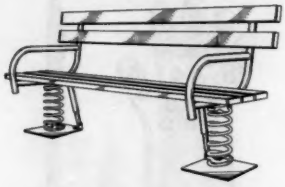
256,190
PAINT PAD
Robert I. Janssen, St. Paul, Minn., assignor to Padco, Inc., Minneapolis, Minn.
Filed Mar. 16, 1978, Ser. No. 887,463
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38



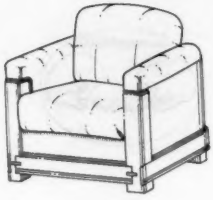
256,191
PORTABLE SUNNING BOARD
Rex D. Richter, 2515 N. 46th Ter., Kansas City, Kans. 66104
Filed Apr. 26, 1978, Ser. No. 900,283
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



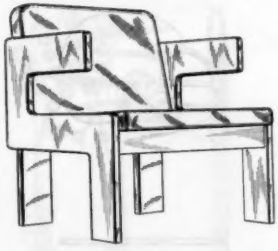
256,192
PARK BENCH WITH SPRING SUPPORT
Steven A. Lofton, Litchfield, Mich., assignor to Game Time, Inc., Fort Payne, Ala.
Filed Aug. 3, 1978, Ser. No. 930,877
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60



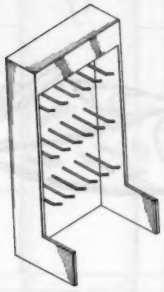
256,193
ARMCHAIR
Samuel T. Collins, Bassett, Va., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed May 3, 1978, Ser. No. 903,355
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



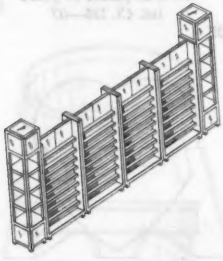
256,194
FOLDABLE CHAIR
Junzo Yoshimura, 8-6 Mejiro, 3-Chome, Toshima-ku, Tokyo, Japan
Filed Sep. 11, 1978, Ser. No. 941,269
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72



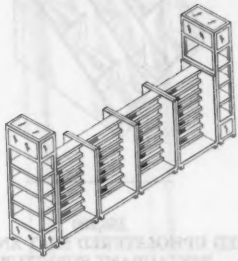
256,195
DISPLAY UNIT
John J. Scalice, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Dec. 11, 1978, Ser. No. 967,999
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—157



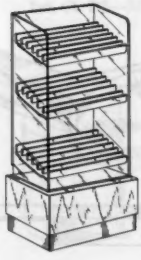
256,196
SET OF MODULAR DISPLAY UNITS
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jun. 20, 1978, Ser. No. 917,156
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—186



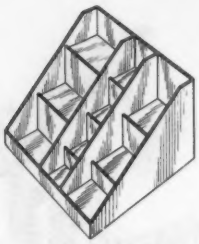
256,197
SET OF MODULAR DISPLAY UNITS
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jun. 20, 1978, Ser. No. 917,158
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—186



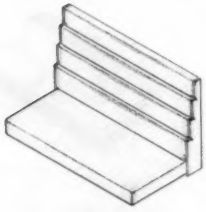
256,198
CLUTCH BAG DISPLAY UNIT
Russell K. Winter, Crownsville; Nedim Savas, Bethesda; Joseph H. Snively, Catonsville, and Thomas D. Harvey, Chevy Chase, all of Md., assignors to Russell William, Ltd., Columbia, Md.
Filed Apr. 23, 1979, Ser. No. 32,174
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—188



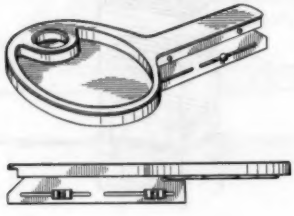
256,199
MERCHANDISE DISPLAY RACK
Robert P. Burke, Cary, N.C.; William A. Cole, Jenkintown, and Jack Gallner, Havertown, both of Pa., assignors to Goodmark Foods, Inc., Minneapolis, Minn.
Filed Dec. 18, 1978, Ser. No. 970,293
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—189



256,200
COMBINED UPHOLSTERED SEAT AND BACK FOR RESTAURANT FURNITURE
Robert K. Radford, Sr., 5117 Otsego Ct., Encino, Calif. 91436
Filed May 1, 1978, Ser. No. 901,736
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197

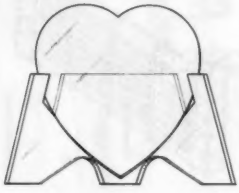


256,201
CHAIR ARM TRAY
Edward Ventura, 18371 Acacia Ave., Lake Elsinore, Calif. 92330
Filed Oct. 18, 1978, Ser. No. 952,573
Term of patent 14 years
Int. Cl. D6—*06*; D7—*99*
U.S. Cl. D6—199

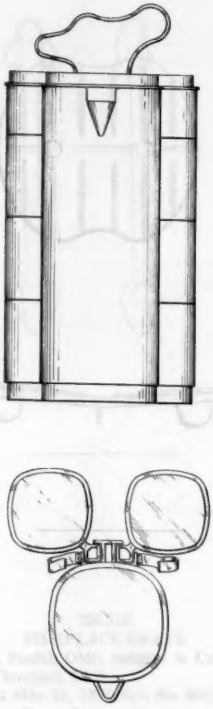


256,202
SLEEPING BAG FOR CHILDREN OR THE LIKE
Barbara H. Schmickel, Ocean Rd., and Elsa S. Cater, Prospect Rd., both of Matunuck, R.I. 02789
Filed Apr. 28, 1978, Ser. No. 901,268
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—203

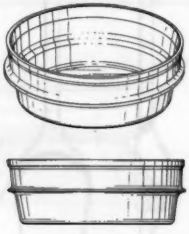
256,203
PICTURE FRAME
Dennis Brothers, 4324 Skylark Dr., Indianapolis, Ind. 46239
Filed Nov. 17, 1978, Ser. No. 961,498
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235



256,204
COMBINED PITCHER AND CUP SET
Yamil Adiv-Maccise, Circuito Poetas No. 35-302, Ciudad Satélite, Mexico
Filed Apr. 27, 1978, Ser. No. 900,537
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—3



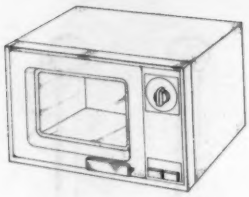
256,205
STACKABLE BOWL OR THE LIKE
Robert F. Bateman, Greenville, and Harold P. Ashton, Providence, both of R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed May 10, 1978, Ser. No. 904,720
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—23



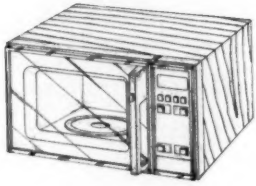
256,206
STRAW
Edwin M. Richmond, P.O. Box 2656, San Rafael, Calif. 94901
Filed Nov. 13, 1978, Ser. No. 959,655
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—42

256,207
CANISTER OR SIMILAR ARTICLE
Ramin Tayebi, 31252 Ceanothus, South Laguna, Calif. 92677
Filed Apr. 24, 1978, Ser. No. 899,308
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—79

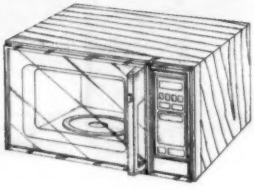
256,208
MICROWAVE OVEN
Masamichi Yamamura, Osaka; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Aug. 16, 1978, Ser. No. 934,330
Claims priority, application Japan, Feb. 20, 1978, 53-6240
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—128



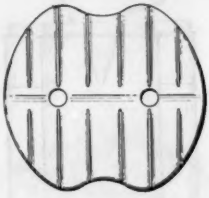
256,209
MICROWAVE OVEN
Yoichi Takahashi, Yamato-koriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 15, 1978, Ser. No. 942,904
Claims priority, application Japan, Mar. 17, 1978, 53-10487
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—128



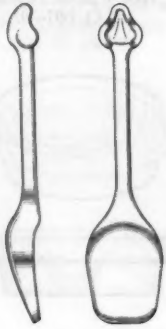
256,210
MICROWAVE OVEN
Yoichi Takahashi, Yamato-koriyama; Toshio Harada, Nara, and Hanji Takahashi, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 15, 1978, Ser. No. 942,905
Claims priority, application Japan, Mar. 17, 1978, 53-10488
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—128



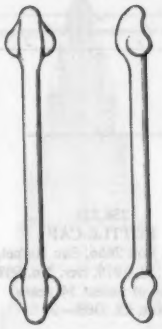
256,211
ROASTING RACK
Albert E. Colato, and James F. Pomroy, both of St. Paul, Minn., assignors to Plastics, Inc., St. Paul, Minn.
Filed Jul. 26, 1978, Ser. No. 928,438
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—130



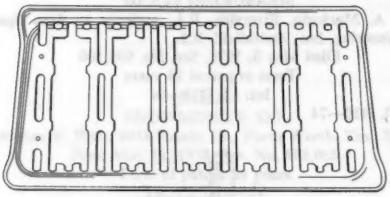
256,212
COMBINED SPOON AND CHOPPER
Edwin Richmond, P.O. Box 2656, San Rafael, Calif. 94901
Filed Nov. 13, 1978, Ser. No. 959,680
Term of patent 14 years
Int. Cl. D07—*03, 04*
U.S. Cl. D7—145



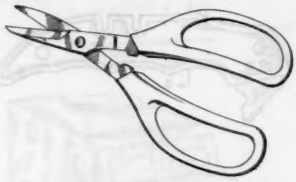
256,213
SPOON
Edwin Richmond, P.O. Box 2656, San Rafael, Calif. 94901
Filed Nov. 31, 1978, Ser. No. 959,711
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—145



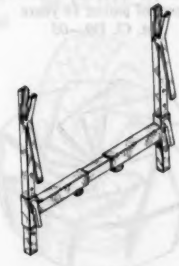
256,214
FIREPLACE GRATE
Donald A. Boyd, Euclid, Ohio, assignor to Cardinal American Corporation, Cleveland, Ohio
Filed May 22, 1978, Ser. No. 907,982
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



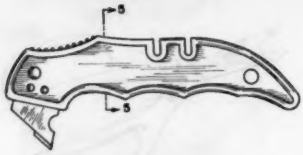
256,215
HOUSEHOLD SCISSORS
Joyce Chen, 763B Concord Ave., Cambridge, Mass. 02138
Filed Aug. 26, 1977, Ser. No. 827,934
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—57



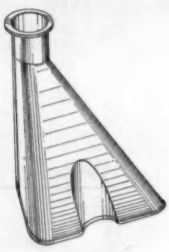
256,216
DUCT WORK SUPPORT
James P. Van Horn, Rte. 2, Box 166, and Vincent J. Rossi, 229 E. Pleasure Dr., both of Mundelein, Ill. 60060
Filed Apr. 11, 1978, Ser. No. 895,299
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—71



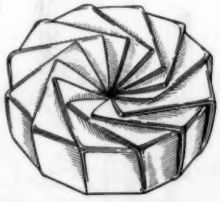
256,217
KNIFE
William W. Korn, Kirkwood, Mo., assignor to K-S-H, Inc.
Filed Oct. 5, 1977, Ser. No. 839,646
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—98



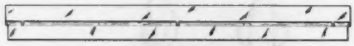
256,218
CAN
Lawrence E. Fritz, 228 New Aquila Court Bldg., Omaha, Nebr. 68102
Filed Aug. 12, 1977, Ser. No. 824,001
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—55



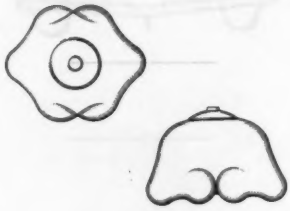
256,219
CONTAINER FOR FOOD OR THE LIKE
Tamio Miyazaki, 3-21-29, Gakuen-nishicho, Kodaira-shi,Tokyo, Japan
Filed Jun. 19, 1978, Ser. No. 917,002
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237



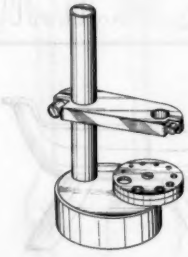
256,220
STORAGE AND DISPLAY TRAY OR SIMILAR ARTICLE
James C. Carroll, and Victor D. Johns, both of Hopkinsville, Ky., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Feb. 9, 1978, Ser. No. 876,434
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—242



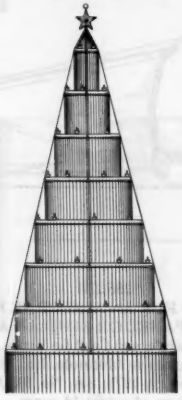
256,221
BOTTLE CAP
Edwin Richmond, P.O. Box 2656, San Rafael, Calif. 94901
Filed Nov. 13, 1978, Ser. No. 959,725
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—269



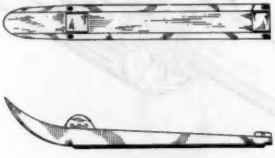
256,222
MEASURING STAND
Virgil A. Machado, Riverside, R.I., assignor to Aero Space Engineering, Inc., Smithfield, R.I.
Filed May 8, 1978, Ser. No. 905,100
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—74



256,223
COLLAPSIBLE ARTIFICIAL CHRISTMAS TREE
Sung W. Byun, 46 Colony Blvd., Wilmington, Del. 19802
Filed Mar. 28, 1978, Ser. No. 891,162
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—118



256,224
SNOWMOBILE SKI
Lawrence E. Fritz, 4916 Rondo Dr., Forth Worth, Tex. 76106
Filed May 11, 1978, Ser. No. 905,065
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



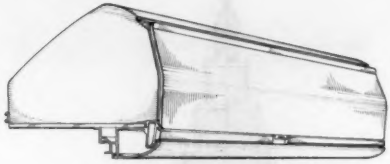
256,225
ARMORED CAR
Russell E. Bauer, 920 Lakeshore Dr., Grosse Pointe Shores, Mich. 48236
Filed Oct. 11, 1977, Ser. No. 844,792
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12

256,226
TIRE
David L. Buck, Sutton Coldfield, and Peter Ingley, Birmingham, both of England, assignors to Dunlop Limited, London, England
Filed Apr. 6, 1978, Ser. No. 894,235
Claims priority, application United Kingdom, Oct. 8, 1977, 981841/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

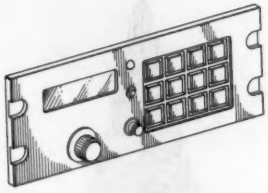
256,227
TIRE
David L. Buck, Sutton Coldfield, and Peter Ingley, Birmingham, both of England, assignors to Dunlop Limited, London, England
Filed Apr. 6, 1978, Ser. No. 894,236
Claims priority, application United Kingdom, Oct. 27, 1977, 982065/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

256,228
TIRE
George M. Robertson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England
Filed Jul. 14, 1978, Ser. No. 924,875
Claims priority, application United Kingdom, Mar. 30, 1978, 983973/78
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

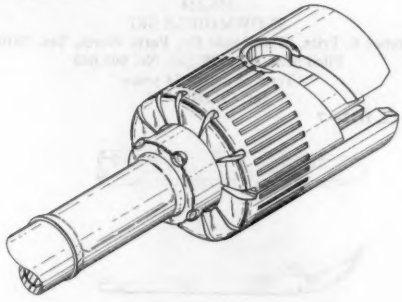
256,229
OVERHEAD LUGGAGE STOWAGE BIN FOR AIRCRAFT
Jack E. Nichols, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.
Filed Apr. 14, 1978, Ser. No. 896,416
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



256,230
CONTROL HEAD FOR AN AIRBORNE POSITIONING CONTROL PANEL OR SIMILAR ARTICLE
Allan A. Beale, Scottsdale, and Cecil La Vance, Paradise Valley, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 9, 1978, Ser. No. 914,093
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12



256,231
COMBINED CONNECTOR LOCKING RING AND CABLE
Ronald C. Laudig, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sep. 11, 1978, Ser. No. 941,608
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



256,232

COMPUTER MODULE

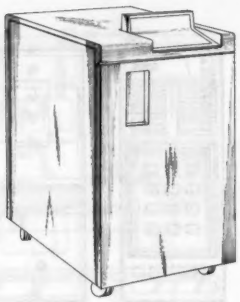
John J. Natoli, Woodstock, N.Y., and Robert E. Steinbugler, Raleigh, N.C., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 27, 1978, Ser. No. 946,306

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—42



256,233

VEHICULAR TELEPHONE SET OR SIMILAR ARTICLE

Hisao Fukushima; Yoshinori Kanda; Michio Ito, and Norimi Koiwa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

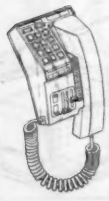
Filed Mar. 31, 1978, Ser. No. 893,141

Claims priority, application Japan, Oct. 5, 1977, 52-39330

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53



256,234

VEHICULAR TELEPHONE SET OR SIMILAR ARTICLE

Hisao Fukushima; Yoshinori Kanda; Michio Ito, and Norimi Koiwa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1978, Ser. No. 900,287

Claims priority, application Japan, Nov. 9, 1977, 52-44144

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53

256,235

VEHICULAR TELEPHONE SET OR SIMILAR ARTICLE

Hisao Fukushima; Yoshinori Kanda; Michio Ito, and Norimi Koiwa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1978, Ser. No. 901,027

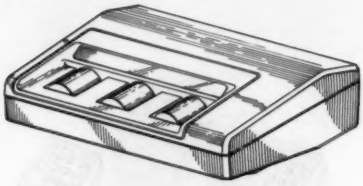
Claims priority, application Japan, Nov. 21, 1977, 52-45759

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—53

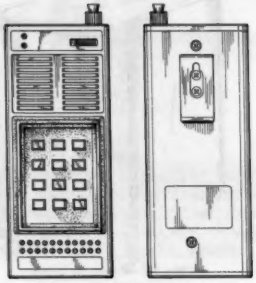
256,236
VEHICULAR TWO-WAY RADIO CONTROL HEAD OR SIMILAR ARTICLE
Albert L. Nagele, Wilmette, Ill., and Masaru Tokiyama, Arlington, Tex., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 21, 1978, Ser. No. 898,352
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59



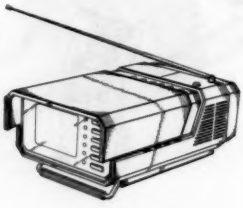
256,237
COMBINED RADIO, WATCH CASE AND LIGHTER
Hoi T. Vong, 179/180 Connaught Rd. West, Cheung Ka Industrial Bldg. 19th Floor, Block A, West Point, Hong Kong
Filed Dec. 2, 1977, Ser. No. 856,810
Claims priority, application United Kingdom, Sep. 9, 1977, 981469/77
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

256,238
TRANSCEIVER
Toshimasa Akazawa, Ashiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Jun. 15, 1978, Ser. No. 915,852
Claims priority, application Japan, Dec. 16, 1977, 52-49812
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

256,239
WIRELESS TELEPHONE
Shinkichi Ota, Funabashi, Japan, assignor to Royce Electronics Corporation, North Kansas City, Mo.
Filed Sep. 22, 1978, Ser. No. 944,877
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



256,240
TELEVISION RECEIVER
Takayo Sugiwaka, Kyoto; Kiyoshi Suzuki, Ibaragi; Masaki Nishioka, and Hiroaki Nishiyori, both of Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 29, 1978, Ser. No. 947,315
Claims priority, application Japan, Apr. 5, 1978, 53-13458
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—81



256,241

WIRELESS TELEPHONE BASE STATION

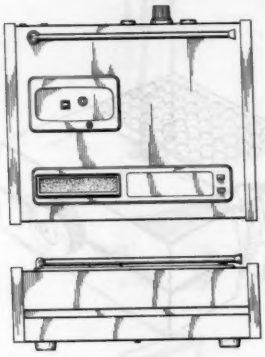
Shinkichi Ota, Funabashi, Japan, assignor to Royce Electronics Corporation, North Kansas City, Mo.

Filed Sep. 22, 1978, Ser. No. 944,876

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—95



256,242

SERVICE STATION FUEL PUMP HOUSING

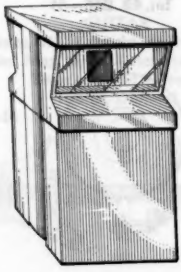
Roland E. Small, Denton, Tex., assignor to Datacon, Inc., Arlington, Tex.

Filed Mar. 13, 1978, Ser. No. 885,690

Term of patent 14 years

Int. Cl. D15—*02*

U.S. Cl. D15—9.1



256,243

DIGGING BLADE FOR A PLOW

John W. Ryan, Yowie Bay, Australia, assignor to Agrowplow Pty. Limited

Filed Apr. 5, 1978, Ser. No. 893,719

Claims priority, application Australia, Oct. 24, 1977, 73169/77

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—11

256,244

DIGGING ADAPTER FOR A PLOW

John W. Ryan, Yowie Bay, Australia, assignor to Agrowplow Pty. Limited

Filed Apr. 5, 1978, Ser. No. 893,720

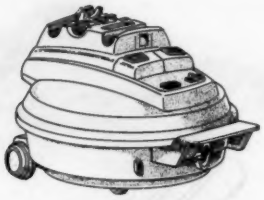
Claims priority, application Australia, Oct. 24, 1977, 73170/77

Term of patent 14 years

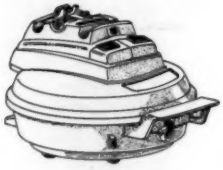
Int. Cl. D15—*03*

U.S. Cl. D15—11

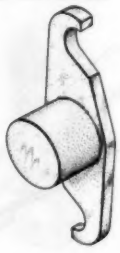
256,245
SUCTION CLEANER OR THE LIKE
John D. Essex, North Canton, and James J. Girard, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed Oct. 23, 1978, Ser. No. 953,425
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—54



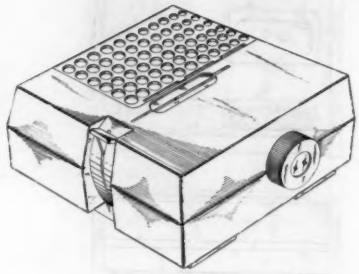
256,246
SUCTION CLEANER OR THE LIKE
John D. Essex, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Oct. 23, 1978, Ser. No. 953,569
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—54



256,247
TOOLCHANGER ARM
Tadeusz W. Piotrowski, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Aug. 22, 1977, Ser. No. 826,778
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—140



256,248
TRANSPARENCY PROJECTOR
Jean P. E. Alt, Lasne, Belgium, assignor to GAF Corporation, New York, N.Y.
Filed Apr. 6, 1978, Ser. No. 894,038
Claims priority, application Benelux, Oct. 18, 1977, 011300-00
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—21



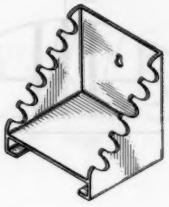
256,249
PHOTOGRAPHIC SHADOWLESS REFLECTOR
Norman W. Bartlett, 2617 Franklinville Rd., Joppa, Md.
Filed Nov. 15, 1977, Ser. No. 851,809
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—38

256,250
COLLAPSIBLE PERISCOPE
Richard T. Tosaw, P.O. Box 888, Modesto, Calif. 95353
Filed Mar. 13, 1978, Ser. No. 886,173
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—48

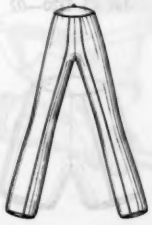
256,251
GUITAR
Charles W. Grimes, 8137 Catawba, Fontana, Calif. 92335
Filed May 15, 1978, Ser. No. 905,882
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—14

256,252
KEYBOARD
Michael D. Burridge, Santa Barbara, Calif., assignor to Essex Transducers Corporation, Carpinteria, Calif.
Filed Dec. 13, 1978, Ser. No. 968,947
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12

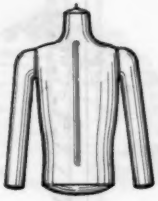
256,253
HOLDER FOR ELONGATED IMPLEMENTS
Paul Suljic, 20829 Roseton Ave., Lakewood, Calif. 90715
Continuation of Ser. No. 832,275, Sep. 12, 1977, abandoned. This application Nov. 3, 1978, Ser. No. 956,930
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—83



256,254
INFLATABLE DISPLAY FORM
David L. Winn, Weston, Mass., assignor to Winn Trading Corp., Boston, Mass.
Filed Jan. 24, 1979, Ser. No. 5,872
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—32

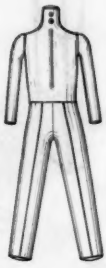


256,255
INFLATABLE DISPLAY FORM
David L. Winn, Weston, Mass., assignor to Winn Trading Corp., Boston, Mass.
Filed Jan. 24, 1979, Ser. No. 5,873
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—32



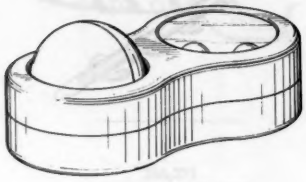
256,256
INFLATABLE DISPLAY FORM
David L. Winn, Weston, Mass., assignor to Winn Trading Corp., Boston, Mass.
Filed Jan. 23, 1979, Ser. No. 5,983
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—32

256,257
INFLATABLE DISPLAY FORM
David L. Winn, Weston, Mass., assignor to Winn Trading Corp., Boston, Mass.
Filed Jan. 24, 1979, Ser. No. 6,087
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D20—31



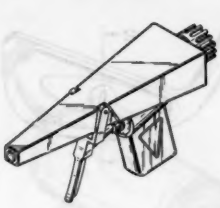
256,258
NOTE HOLDER
Andre J. Varrin, P.O. Box 131, Oregon City, Oreg. 97045
Filed May 11, 1978, Ser. No. 905,104
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D20—43

256,259
RATTLE
Shinroku Nakao, Kanagawa, and Yoshiyasu Ishii, Tokyo, both of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Nov. 1, 1977, Ser. No. 847,522
Claims priority, application Japan, Jul. 8, 1977, 52/26749
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65

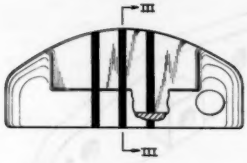


256,260
STILT
Fred Lay, Jr., 4900 Overland Ave., #129, Culver City, Calif. 90230
Filed Feb. 13, 1978, Ser. No. 877,414
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—72

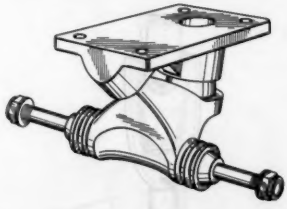
256,261
TOY WATER GUN
Francis M. L. Barthropp, West Vancouver, Canada, assignor to Barton of Canada Ltd., Burnaby, Canada
Filed Jun. 5, 1978, Ser. No. 912,571
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—147



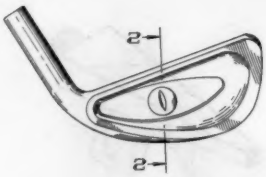
256,262
GOLF PUTTER HEAD
Glenn S. Benson, 705 N. Studebaker, Mishawaka, Ind. 46544
Filed May 30, 1978, Ser. No. 910,587
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219



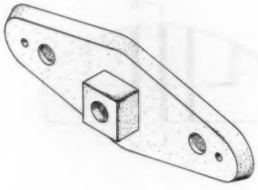
256,263
SKATEBOARD TRUCK
William H. Brawner, El Cajon, Calif., assignor to H.P.G. IV, Inc., El Cajon, Calif.
Filed Mar. 2, 1978, Ser. No. 882,955
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227



256,264
GOLF CLUB HEAD
Karsten Solheim, 501 W. Wakonda La., Phoenix, Ariz. 85023
Filed Jun. 28, 1978, Ser. No. 920,223
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—220



256,265
COMBINED POOL CUE CHALKER AND DRESSER
Carl L. DiLuzio, 48 Hampden St., Indian Orchard, Mass. 01151, and Louis A. Graveline, 1 Meadow St., Ludlow, Mass. 01056
Filed Nov. 22, 1978, Ser. No. 963,168
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—232

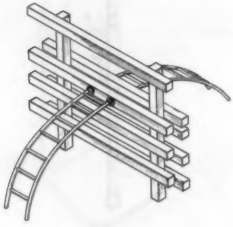


256,266
PORTABLE TEAR GAS CANNISTER HOLSTER
Richard E. Sorgnard, Drawer 35747, Tulsa, Okla. 74135
Filed Apr. 14, 1978, Ser. No. 896,329
Term of patent 14 years
Int. Cl. D22—*99, 99*
U.S. Cl. D22—14

256,267
ARTIFICIAL FISH BAIT
Harvey D. Stutzman, 71954 County Rd. 100, Nappanee, Ind. 46550
Filed Apr. 10, 1978, Ser. No. 894,982
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—27

256,268
FISHING LURE BODY
Howard L. Green, 22200 E. 40 Hwy., Blue Springs, and Clair W. Wood, 1217 Linwood Blvd., Kansas City, both of Mo.
Filed Aug. 23, 1978, Ser. No. 936,037
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

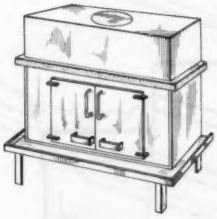
256,269
CHILD RECREATION CLIMBER STRUCTURE
Frank W. Beller, Aurora, Ill., assignor to Recreation Systems Co., North Aurora, Ill.
Filed Sep. 11, 1978, Ser. No. 940,959
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—245



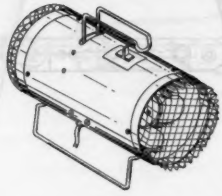
256,270
FISHING LURE
Charles W. McGuirt, 211 DeKalb St., Camden, S.C. 29020
Filed Jan. 2, 1979, Ser. No. 770
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

256,271
SPRAYER
Tetsuya Tada, 6-3, 2-chome, Kakinokizaka, Meguro-ku, Tokyo, Japan
Filed Aug. 1, 1978, Ser. No. 929,936
Claims priority, application Japan, May 31, 1978, 53-22494
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—17

256,272
FIREPLACE
Niilo H. Teeri, Korppaantie 8 D, SF-00300, Helsinki 30, Finland
Filed Apr. 25, 1978, Ser. No. 900,022
Claims priority, application Finland, Oct. 17, 1977, 615/77
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

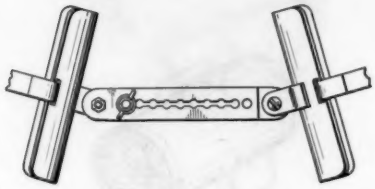


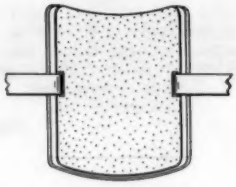
256,273
PORTABLE ELECTRIC HEATER
Donald L. Townsend; Peter E. Huggler, and Rex L. Notbohm, all of Columbia, Mo., assignors to McGraw-Edison Company, Elgin, Ill.
Filed Jun. 23, 1978, Ser. No. 918,665
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—124



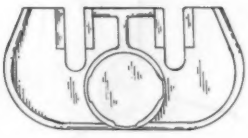
256,274
IONISATOR
Veikko Ilmasti, Skataholmantie, Helsinki 33, Finland (SF-00330)
Filed Sep. 2, 1977, Ser. No. 830,360
Claims priority, application Finland, Mar. 2, 1977, 168/77
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150

256,275
ABDUCTION LEG SPLINT
Stanley E. Thompson, 1108 Morton St., Richmond, Tex. 77469
Filed May 24, 1978, Ser. No. 908,993
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



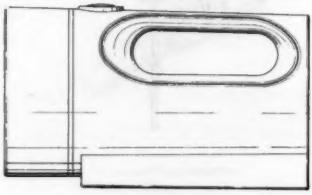


256,276
COMBINED POST CAP AND CHAIN HOLDER
William J. Meis, 6 Valley Dr., Crescent, Iowa 51526
Filed Sep. 18, 1978, Ser. No. 944,031
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—77

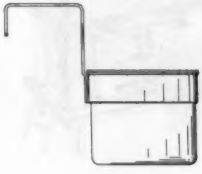


256,277
ROOF TILE OR SIMILAR ARTICLE
Louis K. Warden, Pacific Palisades, Calif., assignor to Pacific Clay Products, Santa Fe Springs, Calif.
Filed Jan. 30, 1978, Ser. No. 873,117
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

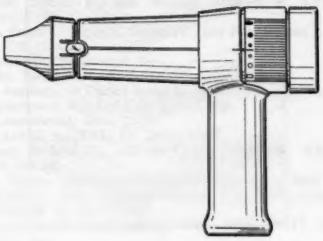
256,278
LANTERN
Chung C. Wong, Kowloon, and Robert E. Brindley, Hong Kong, both of Hong Kong, assignors to Sonca Industries Limited, Kowloon, Hong Kong
Filed Jan. 25, 1978, Ser. No. 872,240
Claims priority, application United Kingdom, Aug. 3, 1977, 981016/77
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—46



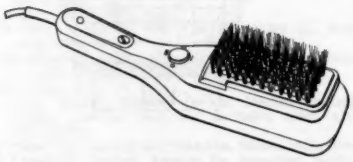
256,279
COMBINATION ASHTRAY AND BEVERAGE CAN HOLDER
George Huggins, 3604 S. Shawnee, Oklahoma City, Okla. 73119
Filed May 1, 1978, Ser. No. 901,729
Term of patent 14 years
Int. Cl. D27—*03*; D7—*01*
U.S. Cl. D27—14

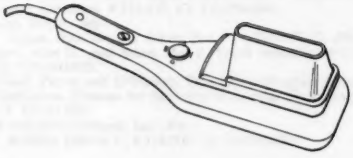


256,280
HAIRDRYER WITH STYLING NOZZLE
Heinz-Ulrich Haase, Kronberg, Fed. Rep. of Germany, assignor to Braun A.G., Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 3, 1977, Ser. No. 839,115
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 738600
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

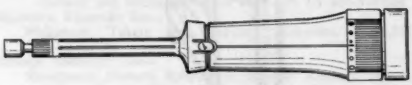


256,281
ELECTRICAL HAIRSTYLING DRYER OR SIMILAR ARTICLE
Michel Rosse, Muttenz, Switzerland, assignor to Blitog SA, Zug, Switzerland
Filed Mar. 9, 1978, Ser. No. 885,033
Claims priority, application Switzerland, Oct. 25, 1977, 65860/77
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13



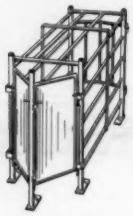


256,282
HAIRDRYER WITH CURLING WAND
Heinz-Ulrich Haase, Kronberg, Fed. Rep. of Germany, assignor to Braun A.G., Frankfurt am Main, Fed. Rep. of Germany
Filed Oct. 3, 1977, Ser. No. 839,116
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 738600
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

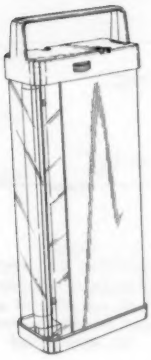


256,283
COSMETIC BOX
Alain Chevassus, Sceaux, France, assignor to Lefebure Isolants Reunis, Chevilly Larue, France
Filed Oct. 23, 1978, Ser. No. 953,776
Claims priority, application France, Apr. 24, 1978, 78 41309
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—83

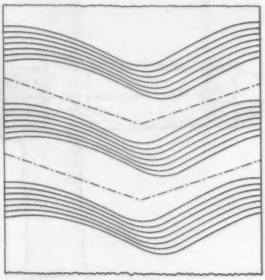
256,284
LIVESTOCK CONFINEMENT PEN
Terry A. Dill, Keota, Iowa, assignor to The Jefferson Industries Company, Fairfield, Iowa
Filed Jun. 5, 1978, Ser. No. 912,236
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



256,285
LANTERN
C. Wong, Kowloon, Hong Kong, assignor to Sonca Industries Limited, Kowloon, Hong Kong
Filed Jul. 7, 1978, Ser. No. 923,259
Claims priority, application United Kingdom, Mar. 29, 1978, 983966/78
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42



256,286
NONWOVEN SHEET MATERIAL OR THE LIKE
Charlotte D. Joachim, Cincinnati, Ohio; Alvin C. March, Aurora, Ind., and Kay S. Ratliff, Hamilton, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 13, 1978, Ser. No. 960,134
Term of patent 14 years
Int. Cl. D5—*06*
U.S. Cl. D92—1 P



256,287
MAIL BOX
Guy E. McConnell, 3729 N. Claremont, Fresno, Calif. 93727
Filed Jun. 2, 1978, Ser. No. 912,049
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—30

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TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF AUGUST, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. C. Sprayers Inc.: *See*—
Jones, Derek, 4,215,758, Cl. 180-128.000.

A. H. Robins Company, Inc.: *See*—
Baum, Laszlo; and Pochon, Philippe, 4,216,325, Cl. 546-225.000.

A/S Strommen Staal: *See*—
Holmen, Hans K., 4,215,851, Cl. 254-277.000.

A-T-O Inc.: *See*—
McGill, Robert W.; and Winiasz, Michael E., 4,215,967, Cl. 414-416.000.
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,216,375, Cl. 235-382.000.

AB Karlshamns Plastindustri: *See*—
Sundin, Harry G. I., 4,215,710, Cl. 132-40.000.

Abajian, Anthony, to United States of America, Army. Variable resistance attenuator. 4,216,445, Cl. 333-81.00R.

Abbott Laboratories: *See*—
Ali, Akhtar, 4,216,142, Cl. 260-112.50R.
Carney, Ronald E.; and McAlpine, James B., 4,216,210, Cl. 424-180.000.
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.
Matsushima, Hideo; and Mori, Yasuki, 4,216,309, Cl. 536-17.00R.

Abcor, Inc.: *See*—
Nuwayser, Elie S., 4,215,698, Cl. 128-734.000.

Abernathy, Lloyd E.: *See*—
Carroll, Cornelius F.; Abernathy, Lloyd E.; and Miller, Allen W., 4,215,666, Cl. 124-41.00A.

Abex Corporation: *See*—
Lawless, Gregory D.; Hirschhorn, Joel S.; and Andersen, Phillip J., 4,216,270, Cl. 428-567.000.

ACF Industries, Incorporated: *See*—
Dare, Roy R.; and Merten, Jeff L., 4,215,749, Cl. 166-361.000.

Acharya, Arun: *See*—
Patterson, Michael F.; and Acharya, Arun, 4,215,798, Cl. 220-421.000.

Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, to DEMAG, Aktiengesellschaft. Apparatus for locking a converter tilting gear during a blasting operation. 4,215,852, Cl. 266-89.000.

Acme Resin Corporation: *See*—
Johnson, Calvin K.; and Craig, Robert S., 4,216,133, Cl. 260-38.000.

Adamowicz, Andrzej: *See*—
Hager, Aleksander; Zajaczkowski, Ryszard; and Adamowicz, Andrzej, 4,215,546, Cl. 60-456.000.

Agar Instrumentation Inc.: *See*—
Zanker, Klaus J., 4,215,565, Cl. 73-30.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Giulianotto, Louis, 4,215,626, Cl. 93-94.00R.

Agency of Industrial Science & Technology: *See*—
Ikari, Yoshikatsu; Yokoyama, Shoichiro; Itaya, Ryutaro; and Ohkuma, Tsuneo, 4,216,084, Cl. 210-32.000.

AGFA-Gevaert, A.G.: *See*—
Feneberg, Paul; Konigl, Georg; Kirchhof, Gunther; and Schatz, Anton, 4,215,933, Cl. 355-50.000.
Freiberg, Gunter, 4,215,915, Cl. 350-255.000.
Laar, Erwin; Sieber, Werner; and Spickenreither, Josef, 4,215,719, Cl. 137-563.000.
Wagensonner, Eduard; and Cocron, Istvan, 4,216,418, Cl. 318-318.000.

AGFA-GEVAERT N.V.: *See*—
De Beul, Victor F.; and Van Hove, Jan H., 4,216,290, Cl. 430-496.000.
Sels, Francis J.; Kokelenberg, Hendrik E.; and van Veelen, George F., 4,216,108, Cl. 252-182.000.

Aguettaz, Jean: *See*—
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.

Agui, Hideo; Saji, Ikutaro; and Nakashita, Mitsuo, to Sumitomo Chemical Company, Limited. Process for preparing N-tritylimidazole compounds. 4,216,333, Cl. 548-345.000.

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Aiken, Ben P.: *See*—
Aiken, John D.; and Aiken, Ben P., 4,215,897, Cl. 296-100.000.

Aiken, John D.; and Aiken, Ben P. Truck tarpaulin device. 4,215,897, Cl. 296-100.000.

Ailloud, Pierre; and D'Haussy, Philippe, to Produits Chimiques Ugine Kuhlmann. Process for recovery of toluene diisocyanate. 4,216,063, Cl. 203-91.000.

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Kofoid, Melvin J., 4,216,000, Cl. 55-138.000.

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Sakakibara, Naoji; and Kawata, Shoji, 4,215,760, Cl. 180-176.000.

Aizawa, Hiroshi: *See*—
Date, Nobuaki; Aizawa, Hiroshi; and Hashimoto, Teiji, 4,215,925, Cl. 354-234.000.

Ajinomoto Co., Inc.: *See*—
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, 4,216,240, Cl. 426-516.000.

Akamata, Kazundo: *See*—
Nishimura, Takeo; and Akamata, Kazundo, 4,216,251, Cl. 427-370.000.

Akashi, Toshihiro: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.

Akita, Sigeyuki; and Wakamatsu, Hisato, to Nippon Soken, Inc. Apparatus for measuring temperature of ultrasonic wave propagation medium. 4,215,575, Cl. 73-339.00A.

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Akiyama, Taichiro; and Mutou, Fumiyo, to Koken Co., Ltd. Injecting apparatus for medical liquid. 4,215,689, Cl. 128-214.00F.

Akred, Ronald J., Sr., to Baker Electrical Products, Inc. Control system for display devices and method. 4,216,471, Cl. 340-764.000.

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Saterdal, Edgar, 4,215,973, Cl. 416-172.000.

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Brandeau, Edward P., 4,216,351, Cl. 174-92.000.

Albanese, Damian F., to International Telephone and Telegraph Corporation. Gated pseudonoise semi-active missile guidance system with improved illuminator leakage rejection. 4,216,472, Cl. 343-7.300.

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Puchalski, Theodore J., Jr.; Albrecht, Robert J.; and Pinto, Albert A., 4,215,969, Cl. 414-571.000.

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Gloppestad, Einar, 4,216,239, Cl. 426-456.000.

Ali, Akhtar, to Abbott Laboratories. Chromogenic substrates for the proteolytic enzymes. 4,216,142, Cl. 260-112.50R.

Allain, Ronald J.; and Maniscalco, Joseph P., to Nalco Chemical Co. Preparation of tetramethyltin from a magnesium-tin alloy. 4,216,066, Cl. 204-59.0QM.

Allen, Alfred E., Jr., deceased; and Day, John W., executor. Low sodium salt seasoning. 4,216,244, Cl. 426-649.000.

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Gladieux, Norman K.; Allen, Carey M.; and Koralewski, Thomas J., 4,216,005, Cl. 65-374.00R.

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Allied Chemical Corporation: *See*—
Evans, Francis E.; Lind, Charles J.; and Robinson, Martin A., 4,216,168, Cl. 260-567.60M.

Allis-Chalmers Corporation: *See*—
Leveraus, James E., 4,216,524, Cl. 362-61.000.

Alsthom-Atlantique: *See*—
Riollet, Gilbert; and Bruneau, Jacques, 4,215,552, Cl. 60-646.000.

Alton Box Board Company: *See*—
Carlson, Frank A., 4,215,780, Cl. 206-424.000.

Alza Corporation: *See*—
Wong, Patrick S., 4,215,691, Cl. 128-260.000.

AM International, Inc.: *See*—
Szabo, Francis S.; and Pick, George G., 4,215,922, Cl. 354-5.000.

Amagasa, Nobutada, to Mitsubishi Denki Kabushiki Kaisha. Protective device for brushless exciting device. 4,216,514, Cl. 361-20.000.

Amazawa, Kiyoshi; Mori, Masaharu; and Taniyama, Takashi, to Clarion Co., Ltd. Noise eliminating circuit with automatic gain control. 4,216,430, Cl. 455-219.000.

Amberg, Ralph G.: *See*—
Amberg, Stephen W.; and Amberg, Ralph G., 4,215,460, Cl. 29-429.000.

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Trawinski, Helmut F., 4,216,081, Cl. 209-496.000.

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Herdzina, Frank J.; and Urso, Patrick F., 4,216,044, Cl. 156-215.000.

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Asato, Goro, 4,216,149, Cl. 260-326.00S.
Bernstein, Seymour, 4,216,164, Cl. 260-506.000.
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Bernstein, Seymour, 4,216,166, Cl. 260-507.00R.
Giglia, Robert D.; and Reddy, Thomas B., 4,215,917, Cl. 350-357.000.
Henderson, William A., Jr., 4,216,331, Cl. 548-320.000.
Hofmann, Corris M.; Press, Jeffery B.; and Safir, Sidney R., 4,216,148, Cl. 260-243.300.
Shepherd, Robert G., 4,216,330, Cl. 548-254.000.

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Klioze, Solomon S.; and Ehrgott, Frederick J., 4,216,218, Cl. 424-267.000.

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Crook, Edward J., 4,215,463, Cl. 29-461.000.

American Home Products Corporation: *See*—
Bellini, Francesco; and Immer, Hans U., 4,216,209, Cl. 424-177.000.
Sarantakis, Dimitrios, 4,216,127, Cl. 260-8.000.
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Tobias, Jaromir, 4,215,624, Cl. 91-499.000.

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Rybicki, Edward B., 4,215,919, Cl. 351-29.000.

Ames, Adolf; Theler, Jean-Jacques; and Wagner, Alfred, to Swiss Aluminium Ltd. Process and device for manufacturing composite sections and similar products. 4,215,560, Cl. 72-258.000.

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Dittmann, Larry E.; and Webster, Van K., 4,215,911, Cl. 339-240.000.
Walter, Donald P. G., 4,215,910, Cl. 339-143.00R.

Anagnostopulos, Hiristo: *See*—
Weber, Rolf-Ortwin; Anagnostopulos, Hiristo; and Gebert, Ulrich, 4,216,216, Cl. 424-251.000.

Andersen, Phillip J.: *See*—
Lawless, Gregory D.; Hirschhorn, Joel S.; and Andersen, Phillip J., 4,216,270, Cl. 428-567.000.

Anderson, Eric A.; and Maier, Walter A., to Anderson, Eric A. Slitting apparatus. 4,215,613, Cl. 83-864.000.

Anderson, Larry W.; Franz, James H., Jr.; and Matty, Thomas C., to Westinghouse Electric Corp. Transit vehicle motor operation control apparatus and method. 4,216,417, Cl. 318-274.000.

Anderson, Matthew E.; Zvada, Timothy P.; and Waller, Jack T., Jr., to United States of America, Navy. Acoustic emission contact fuze with signal processing capability. 4,215,633, Cl. 102-210.000.

Anderson, Scott. Process for producing sodium amalgam particles. 4,216,178, Cl. 264-9.000.

Andersson, Ake A.: *See*—
Holma, Johan E.; Andersson, Ake A.; and Gavlefors, Nils L., 4,215,957, Cl. 407-114.000.

Andrews, Anthony J. Bass sound projection systems. 4,215,761, Cl. 181-152.000.

Andrews, Paul R., to Staveley Machine Tools Limited. Fluid-flow control valves. 4,215,903, Cl. 308-1.00R.

Andruschak, Oleg A.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.

Angelucci, Francesco: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,216,157, Cl. 260-365.000.

Ani-Live Film Service Inc.: *See*—
Cooper, Sidney; and Jacob, Ezekiel J., 4,216,283, Cl. 430-126.000.

Anthony, Robert E., to United Aircraft Products, Inc. Attaching fin material to a heat transfer or like surface. 4,215,454, Cl. 29-157.30R.

Antonious, Anthony J. Adjustable instep gore assembly. 4,215,493, Cl. 36-51.000.

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Antos, John M.; Henke, Arthur W.; Lindsay, Erin J.; and Embach, James T., to Thetford Corporation. Portable toilets. 4,215,445, Cl. 4-323.000.

Aono, Shigeo: *See*—
Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.

Arcamone, Federico: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,216,157, Cl. 260-365.000.

Arendt, Ronald H.; and Curran, Matthew J., to General Electric Company. Process of making electrolyte structure for molten carbonate fuel cells. 4,216,278, Cl. 429-188.000.

Argus Chemical Corporation: *See*—
Halle, Reidar; and Pastorino, Ronald L., 4,216,294, Cl. 521-99.000.

Arit, Dieter; and Jautelat, Manfred, to Bayer Aktiengesellschaft. Novel derivatives of cyclopropanecarboxylic acid useful as intermediates for the preparation of insecticides. 4,216,162, Cl. 260-500.50H.

Armour Pharmaceutical: *See*—
Radowitz, Markus, 4,216,205, Cl. 424-101.000.

Armstrong, Alexander S. Health services combination irrigator and aspirator. 4,215,476, Cl. 433-80.000.

Armstrong Store Fixture Corporation: *See*—
Pfeifer, William, 4,215,789, Cl. 220-96.000.

Arnold, Mark A.: *See*—
Rechnitz, Garry A.; Arnold, Mark A.; and Meyerhoff, Mark E., 4,216,065, Cl. 204-1.00T.

Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, to Societe Chauvin Arnoux. Electromagnetic relay with double-breaking contacts. 4,216,452, Cl. 335-128.000.

Arvin Industries, Inc.: *See*—
Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., 4,216,504, Cl. 358-8.000.

ASA S.A.: *See*—
Beau, Patrick; and Gabalda, Carlos M., 4,215,530, Cl. 57-310.000.

Asai, Koichi; and Kawada, Tousuke, to Fuji Mgf. Co., Ltd. Method of inserting electronic components to a printed circuit board. 4,215,469, Cl. 29-835.000.

Asai, Toshio: *See*—
Sato, Hisaaki; Shintani, Morio; Shinozaki, Takayoshi; Tsuchiya, Takuichi; and Asai, Toshio, 4,216,409, Cl. 315-5.460.

Asano, Masaharu: *See*—
Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.

Asato, Goro, to American Cyanamid Company. dl-N-(4,5,6,7-Tetrahydro-7-oxobenzo[b]thien-4-yl)phthalimide. 4,216,149, Cl. 260-326.00S.

Ashmead, Harvey H. Soluble non-ferrous metal proteinates. 4,216,143, Cl. 260-113.000.

Ashmead, Harvey H. Soluble iron proteinates. 4,216,144, Cl. 260-115.000.

Aslund, Christer: *See*—
Gemmel, Goran; Aslund, Christer; and Solly, Barry, 4,216,013, Cl. 75-125.000.

Assistance Technique Medicale Serdahl, S.A.: *See*—
Zalkin, Daniel; and Maillot, Jean-Pierre, 4,215,681, Cl. 128-204.210.

Astra Lakemedel AB: *See*—
Bamberg, Peter; Vegh, Ladislas J. S.; and Hardegger, Emil, deceased, 4,216,328, Cl. 546-329.000.

Atco Manufacturing Co., Inc.: *See*—
Vorbeck, Donald W., 4,215,649, Cl. 119-15.000.

Atlantic Richfield Company: *See*—
Wilson, William N., 4,216,022, Cl. 106-104.000.

ATP Inc.: *See*—
Molby, Lloyd A., 4,215,547, Cl. 60-465.000.

Audi NSU Auto Union Aktiengesellschaft: *See*—
Steinwart, Johannes; Lummerzheim, Konrad; Bauder, Armin; and Wilmers, Gottlieb, 4,215,538, Cl. 60-276.000.

Ausman, John S., to Litton Systems, Inc. Target marker placement for dive-toss deliveries with wings nonlevel. 4,215,621, Cl. 89-1.50E.

Automobiles Peugeot: *See*—
Horblin, Michel Y., 4,216,520, Cl. 361-239.000.

Avco Corporation: *See*—
Hurley, John F., 4,215,537, Cl. 60-264.000.

Averbuch, Jack A.: *See*—
Averbuch, Martin P.; and Averbuch, Jack A., 4,215,741, Cl. 165-11.00R.

Averbuch, Martin P.; and Averbuch, Jack A. Heat exchanger. 4,215,741, Cl. 165-11.00R.

Ayer, Patrick. Arterial blood extraction device. 4,215,702, Cl. 128-766.000.

Ayers, Buell O.: *See*—
Clardy, Edwin K.; and Ayers, Buell O., 4,215,563, Cl. 73-23.100.

B. F. Goodrich Company, The: *See*—
McRowe, Arthur W., 4,216,139, Cl. 260-45.75C.
Skillicorn, Douglas E., 4,216,302, Cl. 526-312.000.

Baardsen, Per, to Chevron Research Company. Offshore structure for use in waters containing large moving ice masses. 4,215,952, Cl. 405-211.000.

Baba, Makoto; Ninomiya, Teruyuki; and Ono, Chieko, to Mitsubishi Gas Chemical Co., Inc. Process for preparing esters. 4,216,337, Cl. 560-78.000.

Baba, Sadaaki: *See*—
Hotta, Shigenori; Baba, Sadaaki; and Takahashi, Masaru, 4,216,456, Cl. 337-114.000.

Babberl, Marion G., to Rapid Mounting & Finishing Company. Display system. 4,215,840, Cl. 248-221.400.

Babcock & Wilcox Company, The: *See*—
Bowen, Stanley, 4,215,844, Cl. 251-28.000.

Babel, Werner, to Maho Werkzeugmaschinenbau Babel & Co. Locking mechanism for the mandrel collar on milling and drilling spindles. 4,215,961, Cl. 409-231.000.

Babik, Peter P. Toilet anti-splash and silencer device. 4,215,443, Cl. 4-300.300.

Backof, Charles A., Jr.; and Robins, David S., to Motorola, Inc. Programmable digital tone detector. 4,216,463, Cl. 340-171.00R.

Badalamenti, Michael: *See*—
Davis, Danny L., 4,215,809, Cl. 228-48.000.

Bagner, Carl: *See*—
Weinstock, Leonard M.; Wildman, Arthur S.; and Bagner, Carl, 4,216,340, Cl. 562-469.000.

Bahiman, Hossein, to United States of America, National Aeronautics and Space Administration. Belt for transmitting power from a cogged driving member to a cogged driven member. 4,215,590, Cl. 474-205.000.

Bahler, Peter: *See*—
Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, 4,215,782, Cl. 206-525.000.

Baker, Alan S., to Imperial Chemical Industries Limited. Demulsification process. 4,216,114, Cl. 252-341.000.

Baker, Don R.; and Hyzak, Daniel L., to Stauffer Chemical Company. Dialkyl amino ethyl amides, their salts and their use as anti-ripening agents. 4,216,238, Cl. 426-321.000.

Baker Electrical Products, Inc.: *See*—
Akred, Ronald J., Sr., 4,216,471, Cl. 340-764.000.
Bakos, Peter; Haggett, Roger E.; and Poliak, Richard M., to International Business Machines Corporation. Removable protective coating and process of using same. 4,216,035, Cl. 148-23.000.
Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Sample-hold phase detector. 4,216,396, Cl. 307-353.000.
Baldwin, John L. E.; Bellis, Robert A.; and Ive, John G. S., to Independent Broadcasting Authority. Transmission and/or recording of digital signals. 4,216,460, Cl. 371-57.000.
Bamberg, Peter; Vegh, Ladislas J. S.; and Hardegger, Emil, deceased (by Hardegger, Olga, sole heir), to Astra Lakemedel AB. Novel intermediate for preparation of therapeutically active compounds. 4,216,328, Cl. 546-329.000.
Banks, Reginald G. S.; and Williams, Alan, to British Gas Corporation. Catalyst for steam reforming of hydrocarbons. 4,216,123, Cl. 252-466.00J.
Barber-Colman Company: *See*—
Patel, Dhiru, 4,215,455, Cl. 28-204.000.
Barrett, John H., Jr.; and Formeloza, Elizabeth F., to Purex Corporation. Peroxygen bleaching and laundering compositions. 4,215,990, Cl. 8-107.000.
Barron, Jeanette W. Patient's hospital gown. 4,215,434, Cl. 2-114.000.
Barsaloux, Reginald G. Fluid sampling apparatus. 4,215,580, Cl. 73-425.40R.
Bartheld, Robert G.; and Diamant, Paul, to Siemens-Allis, Inc. Dynamoelectric machine support frame. 4,216,399, Cl. 310-91.000.
Bartl, Herbert: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.
BASF Aktiengesellschaft: *See*—
Manzke, Klaus; Brotzler, Roland; Berg, Gerhard; and Uhl, Karl, 4,216,510, Cl. 360-99.000.
BASF Wyandotte Corporation: *See*—
Vogt, Herwart C.; Brizgys, Bernardas; Cenker, Moses; and Patton, John T., Jr., 4,216,107, Cl. 252-182.000.
Bash, Leroy A.: *See*—
Cherry, Raymond B; and Bash, Leroy A., 4,215,908, Cl. 339-96.000.
Basov, Vladislav V.: *See*—
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F., 4,215,562, Cl. 73-15.0FD.
Bassett, Peter J.: *See*—
Fisher, John H.; Bradbrook, John D.; and Bassett, Peter J., 4,215,480, Cl. 33-125.00C.
Batchelder, Clarence F.; and Casady, Kent B., to Khartli, Inc. Torque multiplier assembly. 4,215,599, Cl. 81-52.40R.
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, to Montedison S.p.A. Water-insoluble mono-azo yellow dyes derived from 1-phenyl-3-aminopyrazoles. 4,216,145, Cl. 260-156.000.
Bauder, Armin: *See*—
Steinwart, Johannes; Lummerzheim, Konrad; Bauder, Armin; and Wilmers, Gottlieb, 4,215,538, Cl. 60-276.000.
Bauer, Roland: *See*—
Hartmann, Bernd; Haar, Wilhelm; Fischer, Wilfried; and Bauer, Roland, 4,216,275, Cl. 429-104.000.
Baum, Laszlo; and Pochon, Philippe, to A. H. Robins Company, Inc. 4-(p-Fluorobenzoyl)-1-[3-(p-fluorobenzoyl)propyl]piperidine. 4,216,325, Cl. 546-225.000.
Baxter Travenol Laboratories, Inc.: *See*—
Terman, David S.; Sulliva, Michael; and Cullis, Herbert M., 4,215,688, Cl. 128-214.00R.
Bayer Aktiengesellschaft: *See*—
Arlt, Dieter; and Jautelat, Manfred, 4,216,162, Cl. 260-500.50H.
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.
Heine, Hans-Georg; and Hartmann, Willy, 4,216,172, Cl. 568-364.000.
Kysela, Ernst; Lantzsch, Reinhard; and Klauke, Erich, 4,216,173, Cl. 260-654.00R.
Lenthe, Manfred; and Dankert, Gerhard, 4,216,332, Cl. 548-337.000.
Roos, Ernst; and Hugl, Erika, 4,216,158, Cl. 260-396.00N.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.
Sylvester, Gerd; Beck, Manfred; Witte, Josef; and Pampus, Gottfried, 4,216,121, Cl. 252-431.00C.
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,216,228, Cl. 424-322.000.
Bayley, Barry J.; Brittain, Austin; Graham, Kenneth; and Thawley, Clive S., to Uniroyal Limited. Apparatus for treating the surfaces of cylindrical objects in a number of sequential steps. 4,215,928, Cl. 354-319.000.
BBC Brown Boveri & Company Limited: *See*—
Kach, Alfred, 4,216,449, Cl. 333-236.000.
Beadle, Burton J.: *See*—
Rigge, Ronald J.; Beadle, Burton J.; and Belding, William A., 4,216,130, Cl. 260-29.70R.
Beau, Patrick; and Gabalda, Carlos M., to ASA S.A. Process and apparatus for manufacturing a drawn and twisted multifilament synthetic yarn. 4,215,530, Cl. 57-310.000.
Becerra Novoa, Jorge O.: *See*—
Martinez Vera, Enrique R.; and Becerra Novoa, Jorge O., 4,216,011, Cl. 75-91.000.
Beck, Manfred: *See*—
Sylvester, Gerd; Beck, Manfred; Witte, Josef; and Pampus, Gottfried, 4,216,121, Cl. 252-431.00C.
Becker, Lanson, to General Signal Corporation. Fluid control valve system. 4,215,720, Cl. 137-596.200.
Beecham, David; and Kane, Jack, to Bell Telephone Laboratories, Incorporated. Detector circuitry. 4,216,395, Cl. 307-350.000.
Beecham Group Limited: *See*—
Clayton, John P.; Rogers, Norman H.; and Coulton, Steven, 4,216,223, Cl. 424-283.000.
Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., 4,216,232, Cl. 424-331.000.
Belding, William A.: *See*—
Rigge, Ronald J.; Beadle, Burton J.; and Belding, William A., 4,216,130, Cl. 260-29.70R.
Bell, Alan E., to RCA Corporation. Optical anti-reflective information record. 4,216,501, Cl. 358-128.500.
Bell, Billy W.; and Ferguson, Walter D. Submerged meter reading device. 4,215,916, Cl. 350-319.000.
Bell & Howell Company: *See*—
Grant, Frederic F.; and Martija, Henry M., 4,216,505, Cl. 360-104.000.
Ludtke, Gerald W.; Butler, Glenn A.; and Krtous, George F., 4,216,506, Cl. 360-74.100.
Bell Telephone Laboratories, Incorporated: *See*—
Beecham, David; and Kane, Jack, 4,216,395, Cl. 307-350.000.
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,216,051, Cl. 156-499.000.
Burke, Edmund T.; and Jones, David F., 4,216,356, Cl. 179-99.0LS.
Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., 4,216,489, Cl. 357-41.000.
Linke, Richard A.; and Schneider, Martin V., 4,216,450, Cl. 333-248.000.
Tsang, Won-Tien, 4,216,036, Cl. 148-175.000.
Bellini, Francesco; and Immer, Hans U., to American Home Products Corporation. Tripeptide angiotensin converting enzyme inhibitors. 4,216,209, Cl. 424-177.000.
Bellino, Ralph R.: *See*—
Smith, Richard J., Jr.; and Bellino, Ralph R., 4,215,658, Cl. 123-41.440.
Bellis, Robert A.: *See*—
Baldwin, John L. E.; Bellis, Robert A.; and Ive, John G. S., 4,216,460, Cl. 371-57.000.
Belokur, Alexandr N.: *See*—
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F., 4,215,562, Cl. 73-15.0FD.
Benckiser-Knapsack GmbH: *See*—
Sommer, Klaus; and Weber, Hermann, 4,216,163, Cl. 260-502.500.
Bennett, Derek J., to Bunker Ramo Corporation. System for deploying a moored sensor array. 4,216,535, Cl. 367-4.000.
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., to Weyerhaeuser Company. Low-consistency ozone delignification. 4,216,054, Cl. 162-57.000.
Beremand, Donald G., to United States of America, National Aeronautics and Space Administration. Free-piston regenerative hot gas hydraulic engine. 4,215,548, Cl. 60-520.000.
Berg, Gerhard: *See*—
Manzke, Klaus; Brotzler, Roland; Berg, Gerhard; and Uhl, Karl, 4,216,510, Cl. 360-99.000.
Berkman, Samuel: *See*—
United States of America, National Aeronautics and Space Administration; Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E., 4,216,186, Cl. 422-246.000.
Bernstein, Seymour, to American Cyanamid Company. Ureide inhibitors of connective tissue destruction. 4,216,164, Cl. 260-506.000.
Bernstein, Seymour, to American Cyanamid Company. Amine precursors to ureide inhibitors of connective tissue destruction. 4,216,165, Cl. 260-507.00R.
Bernstein, Seymour, to American Cyanamid Company. Nitro precursors to amine precursors to ureide inhibitors of connective tissue destruction. 4,216,166, Cl. 260-507.00R.
Berthelot, Alain: *See*—
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.
Bertolini, Raffaello: *See*—
Tonali, Roberto; and Bertolini, Raffaello, 4,216,269, Cl. 428-500.000.
Best & Donovan: *See*—
Wikoff, Mark W., 4,215,451, Cl. 17-21.000.
Bethards, Charles W., to Motorola, Inc. Adaptive audio compressor. 4,216,427, Cl. 455-119.000.
BFG Glassgroup: *See*—
Groth, Rolf, 4,216,259, Cl. 428-216.000.
Bichsel, Heinz: *See*—
Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, 4,216,016, Cl. 75-141.000.
Bilek, Frank T., to Texas Instruments Incorporated. Flexible magnetic recording disc with cartridge having a latching drive member. 4,216,511, Cl. 360-133.000.

Billings Energy Corporation: *See*—
Simons, Harold M., 4,216,198, Cl. 423-648.00R.

Bilofsky, Ruth C.; and Rogers, Howard G., to Polaroid Corporation. Photographic products and processes employing lamellar pigments. 4,216,018, Cl. 430-207.000.

Bindin, Peter J., to Chloride Silent Power Limited. Method of sealing ceramic electrolyte material in electrochemical cells. 4,215,466, Cl. 29-623.200.

Bishop, Arthur E. Low friction rack and pinion steering gear. 4,215,591, Cl. 74-422.000.

Bison-werke Bahre & Greten GmbH & Co. KG: *See*—
Lamberts, Kurt; Leppin, Jurgen; Greten, Berndt; and Neubauer, Harry, 4,216,179, Cl. 264-25.000.

Bjorkman, Karl A. G.; and Jonsson, Gunther, to Lumalampan Aktiebolag. Electric lamp wherein the terminal socket cap contains a foamed cap cement which functions to prevent explosions and/or burning a hole through the cap. 4,216,406, Cl. 313-315.000.

Blackstone Corporation: *See*—
Weed, Lauren R., 4,215,742, Cl. 165-51.000.

Blaimschein, Gottfried, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft. Milling machine. 4,215,604, Cl. 82-20.000.

Blair, W. Roscoe, to Raybestos-Manhattan, Inc. Flanged corner construction and method. 4,215,518, Cl. 52-658.000.

Blake, Charles E.: *See*—
Otis, Harold R.; Blake, Charles E.; and Schmidt, Paul J., 4,216,263, Cl. 428-383.000.

Blanken, Jacob: *See*—
Kuiper, Adrianus; Boelens, Paulus R.; and Blanken, Jacob, 4,215,457, Cl. 29-25.140.

Blase, Manfred, to Didier Engineering GmbH. Sealing arrangement for coke oven door. 4,216,061, Cl. 202-248.000.

Blatchford, Brian G.; and Woolnough, Victor J., to Chas. A. Blatchford & Sons Limited. Multi-bar linkage knee with fixed rotation axis. 4,215,442, Cl. 3-22.000.

Blaupunkt Werke GmbH: *See*—
Flickshu, Peter; and Wenzel, Diethard, 4,216,545, Cl. 455-77.000.

Bloom, Roger A.: *See*—
Cagle, George C.; and Bloom, Roger A., 4,216,543, Cl. 375-95.000.

Blue Wing Corporation: *See*—
Rawlings, Robert M.; and Procter, Donald, 4,216,234, Cl. 426-2.000.

Blum, Alvin S. Label system for identifying items. 4,215,879, Cl. 283-21.000.

Bob's Casing Crews: *See*—
Carstensen, Kenneth J.; and Staudt, John J., III, 4,215,602, Cl. 81-57.180.

Boddeker, Hans: *See*—
Heyer, Gunter; and Boddeker, Hans, 4,215,486, Cl. 34-45.000.

Boeckeler, Rudolph H., to Freeman Chemical Corporation. Film-forming polymerizable resin of benzophenone dianhydride, epoxy compound and unsaturate carboxylic acid. 4,216,306, Cl. 528-115.000.

Boeing Commercial Airplane Company: *See*—
Hilliard, Lonnie G.; and Sibborn, Michael J., 4,216,047, Cl. 156-285.000.

Boeing Company, The: *See*—
Kisovec, Adrian V., 4,215,587, Cl. 74-22.00R.
Pond, Charles R.; and Hall, Richard B., 4,216,439, Cl. 331-94.50C.
Rudolph, Peter K. C., 4,215,536, Cl. 60-262.000.

Boelens, Paulus R.: *See*—
Kuiper, Adrianus; Boelens, Paulus R.; and Blanken, Jacob, 4,215,457, Cl. 29-25.140.

Boettcher, Charles E., to National Semiconductor Corporation. Charge coupled device with reduced power consumption upon charge transfer. 4,216,386, Cl. 307-221.00D.

Boffa, Gioacchino: *See*—
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, 4,216,145, Cl. 260-156.000.

Bogart, Steven L.: *See*—
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., 4,216,054, Cl. 162-57.000.

Boge GmbH: *See*—
Brenner, Heinz; and Hamaekers, Arno, 4,215,842, Cl. 248-562.000.

Bohanna & Pearce, Inc.: *See*—
Nadolsky, Isaac, 4,215,671, Cl. 126-164.000.

Boleda, Alberto; and Wakerly, John F., to Northern Telecom Limited. Digital clock recovery circuit. 4,216,544, Cl. 375-119.000.

Bolesky, Richard C.: *See*—
Gold, Barry L.; and Bolesky, Richard C., 4,215,439, Cl. 3-1.911.

Bolick, Stephen M.; and Vought, John O. Pressure regulator assembly guard. 4,215,581, Cl. 73-431.000.

Bonderman, Dean P.: *See*—
Proksch, Gary J.; and Bonderman, Dean P., 4,216,117, Cl. 252-408.000.

Bonfield, Peter L.: *See*—
Slagel, Gary A.; and Bonfield, Peter L., 4,216,522, Cl. 361-392.000.

Bonnebat, Claude; and Halna du Fretay, Gerard, to Rhone-Poulenc Industries. Molding process for the fabrication of hollow shaped articles. 4,216,253, Cl. 428-35.000.

Bonomo, Melvin E.; Coldren, Kenneth M.; Rathbun, Loren L.; and Towner, Ronald D., to M & W Gear Company. Unitary valve for water brake dynamometer. 4,215,569, Cl. 73-134.000.

Boon, Arthur G.; and Page, Harold R. S., to Water Research Centre. Waste water treatment. 4,216,089, Cl. 210-63.00R.

Boots, Vernie A. Hand operated pickup device for deposited material. 4,215,887, Cl. 294-1.0BA.

Borgen, Gerd: *See*—
Dale, Johannes; and Borgen, Gerd, 4,216,083, Cl. 210-31.00R.

Borghorst, Friedhelm, to Mannesmann Demag AG. Oscillating apparatus for strand casting mold. 4,215,739, Cl. 164-416.000.

Bormann, Uwe, to Wampfler GmbH. Conductive rail assembly. 4,215,770, Cl. 191-23.00R.

Borsuk, Leslie M., to International Telephone and Telegraph Corporation. Method and apparatus for detecting optimum alignment of optical fibers in a connector arrangement. 4,215,937, Cl. 356-73.100.

Bos, John R.: *See*—
Workman, William, Jr.; and Bos, John R., 4,215,594, Cl. 74-751.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Heyer, Gunter; and Boddeker, Hans, 4,215,486, Cl. 34-45.000.

Bosch, Toivo, to J. M. Voith GmbH. Joint structure. 4,215,882, Cl. 285-227.000.

Bossert, Theodor T., to Richard Hirschmann, Radiotechnisches Werk. Method and apparatus for quantitatively measuring the reception quality of a received frequency-modulated ultrashort-wave signal. 4,216,429, Cl. 455-148.000.

Bost, Howard W.; and Yokley, Tommey A., Jr., to Phillips Petroleum Company. Flame-resistant polyolefin compositions. 4,216,138, Cl. 260-45.75B.

Botsco, Ronald J.; Todd, John E.; and Jones, Robert L., to NDT Instruments, Inc. Apparatus and method for bondtesting by ultrasonic complex impedance plane analysis. 4,215,583, Cl. 73-582.000.

Boudreaux, Raymond E.: *See*—
Thomas, Louis O.; and Boudreaux, Raymond E., 4,215,478, Cl. 433-25.000.

Boulay, Jean-Louis; and Hoarau, Roland J., to Office National d'Etudes et de Recherches Aerospatiales (ONERA). Electrostatic discharger, particularly for aircrafts. 4,216,519, Cl. 361-218.000.

Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., to Arvin Industries, Inc. Slow motion color video recording and playback system. 4,216,504, Cl. 358-8.000.

Bowen, Stanley, to Babcock & Wilcox Company, The. Valve actuator system. 4,215,844, Cl. 251-28.000.

Bowles, Vernon O., to Solartrap, Inc. Heat exchanger. 4,215,744, Cl. 165-158.000.

Boyllin, John A., to Rabone Chesterman Limited. Coilable tape measures. 4,215,829, Cl. 242-107.000.

Bradbrook, John D.: *See*—
Fisher, John H.; Bradbrook, John D.; and Bassett, Peter J., 4,215,480, Cl. 33-125.00C.

Bradshaw, Thomas I.: *See*—
Seemann, Ronald W.; and Bradshaw, Thomas I., 4,216,180, Cl. 264-35.000.

Bralorne Resources Limited: *See*—
Sturgeon, Leonard A., 4,215,845, Cl. 251-63.000.

Brandeau, Edward P., to Akzona Incorporated. Plastic collar integral with a cable jacket. 4,216,351, Cl. 174-92.000.

Braverman, Amiel. Microcrystalline cellulose in freezable-gel-confection compositions. 4,216,242, Cl. 426-573.000.

Breazu, Dorin: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.

Brehm, Rudolf; and Franken, Adrianus J. J., to U.S. Philips Corporation. Method of breaking optical fibers. 4,216,004, Cl. 65-2.000.

Brehm, Timothy L.: *See*—
Werth, Robert L.; and Brehm, Timothy L., 4,216,461, Cl. 340-149.00R.

Bremer, Roger E.; and Falb, Richard D., to Graphic Controls Corporation. Biomedical electrode with pressurized skin contact. 4,215,696, Cl. 128-641.000.

Brenner, Heinz; and Hamaekers, Arno, to Boge GmbH. Rubber elastic engine mounts or supports with hydraulic damping. 4,215,842, Cl. 248-562.000.

Brenner, Walter. Triallylcyanurate or triallylisocyanurate based adhesive sealant systems. 4,216,134, Cl. 260-40.00R.

Brenz, Richard E.: *See*—
Spitz, Eugene B.; Brenz, Richard E.; and Hansford, Charles C., 4,215,695, Cl. 128-350.00V.

Bridgestone Tire Company Limited: *See*—
Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, 4,215,737, Cl. 152-362.00R.
Sato, Takeshi, 4,215,735, Cl. 152-354.00R.
Suzuki, Yasuo; Tamura, Akira; and Matsumoto, Kenji, 4,215,734, Cl. 152-209.0WT.

Britax (Wingard) Ltd.: *See*—
Cunningham, Douglas J., 4,215,830, Cl. 242-107.000.

British Gas Corporation: *See*—
Banks, Reginald G. S.; and Williams, Alan, 4,216,123, Cl. 252-466.00J.

British Hovercraft Corporation Limited: *See*—
Henry, John; and Dadswell, John E., 4,215,757, Cl. 180-127.000.

Britt, John P., to Pinna Corporation. Frangible strip of clips and method of making it. 4,215,606, Cl. 83-23.000.

Brittain, Austin: *See*—
Bayley, Barry J.; Brittain, Austin; Graham, Kenneth; and Thawley, Clive S., 4,215,928, Cl. 354-319.000.

Brizgys, Bernardas: *See*—
Vogt, Herwart C.; Brizgys, Bernardas; Cenker, Moses; and Patton, John T., Jr., 4,216,107, Cl. 252-182.000.

Brochman, Wilfred R., to Minnesota Mining and Manufacturing Company. Easy open closure system. 4,215,791, Cl. 220-258.000.
Brockelsby, Norman D.: *See*—
Haase, Reinhold A.; Brockelsby, Norman D.; and Pike, Daniel W., 4,215,850, Cl. 254-350.000.
Bron, Evert J. S. Cigarettepipe with purifier. 4,215,708, Cl. 131-262.00B.
Brooks, Burton: *See*—
Brooks, Richard J.; and Brooks, Burton, 4,216,001, Cl. 55-240.000.
Brooks, Richard J.; and Brooks, Burton, to Chemithon Corporation, The. Gas scrubbing apparatus. 4,216,001, Cl. 55-240.000.
Brookshire, Phillip L.: *See*—
Miller, John A.; Brookshire, Phillip L.; and O'Neil, William J., Jr., 4,215,597, Cl. 81-9.10R.
Brotzler, Roland: *See*—
Manzke, Klaus; Brotzler, Roland; Berg, Gerhard; and Uhl, Karl, 4,216,510, Cl. 360-99.000.
Brouard, Rene: *See*—
Chahvekilian, Edgar; and Brouard, Rene, 4,216,077, Cl. 208-57.000.
Brown, Boveri & Cie AG: *See*—
Hartmann, Bernd; Haar, Wilhelm; Fischer, Wilfried; and Bauer, Roland, 4,216,275, Cl. 429-104.000.
Weddigen, Gert; Ege, Gunther; and Vogtle, Friedrich, 4,216,276, Cl. 429-104.000.
Brown Brothers & Company, Ltd.: *See*—
Stevenson, William D., 4,215,950, Cl. 405-195.000.
Brown Company: *See*—
VanderLugt, Thomas, Jr., 4,215,783, Cl. 206-626.000.
Brown, James N.: *See*—
Schams, Ronald T.; and Brown, James N., 4,216,257, Cl. 428-93.000.
Brown, Theodore C., Sr. Coupling for pipes and fittings. 4,215,883, Cl. 285-236.000.
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Heterocyclic alkyl 4-pyrimidones. 4,216,318, Cl. 544-310.000.
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., to Bell Telephone Laboratories, Incorporated. Apparatus for making bondable finger contacts. 4,216,051, Cl. 156-499.000.
Brown, William T. Shower stall. 4,215,444, Cl. 4-612.000.
Brown & Williamson Tobacco Corporation: *See*—
Summers, Thomas W.; and Kohnhorst, Earl E., 4,216,080, Cl. 209-469.000.
Brozille, Jean-Yves, to Crouzet. Snap switch. 4,216,358, Cl. 200-67.00D.
Bruneau, Jacques: *See*—
Riollet, Gilbert; and Bruneau, Jacques, 4,215,552, Cl. 60-646.000.
Bruning, Hugo A. C. M.; Van Vocht, Johannes H. N.; Westendorp, Frans F.; and Zijlstra, Hinne, to U.S. Philips Corporation. Battery with hydrogen absorbing material of the formula LnM_5. 4,216,274, Cl. 429-57.000.
Buckley, Herman T., to Calloway Chemical Company. Polyester compositions and articles sized therewith. 4,216,260, Cl. 428-261.000.
Budden, Renke: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.
Budelman, Gerald A.; and Turner, James A., to CBS Inc. System for recording and automatic playback of a musical performance. 4,215,619, Cl. 84-1.280.
Buehner, William L.; and Hill, James D., to International Business Machines Corporation. Multiple speed ink jet printer. 4,216,480, Cl. 346-75.000.
Buinewicz, Benedict R.: *See*—
Coburn, Robert E.; and Buinewicz, Benedict R., 4,215,609, Cl. 83-492.000.
Bunker Ramo Corporation: *See*—
Bennett, Derek J., 4,216,535, Cl. 367-4.000.
Burdick, Alan D.: *See*—
Skinner, Harry W.; and Burdick, Alan D., 4,215,868, Cl. 277-1.000.
Burgio, Antonio, to Fiat Auto S.p.A. Combustion chamber of a diesel cycle internal combustion engine. 4,215,657, Cl. 123-269.000.
Burke, Edmund T.; and Jones, David F., to Bell Telephone Laboratories, Incorporated. Telephone having separate voice and signaling pairs. 4,216,356, Cl. 179-99.0LS.
Burns, Fredrick B.; and Shaw, Richard J., to E Z Paintr Corporation. Paint applying tool. 4,215,448, Cl. 15-210.00R.
Burroughs Corporation: *See*—
Flora, Laurence P., 4,216,426, Cl. 455-28.000.
Reid, Gilbert R., 4,216,350, Cl. 174-68.500.
Burroughs Wellcome Co.: *See*—
Johnston, Michael D., 4,216,203, Cl. 424-85.000.
Yeowell, David A.; and Swaringen, Roy A., Jr., 4,216,319, Cl. 544-325.000.
Burtelson, Frederick W., to Reliable Electric Company. Device for cleaning grease-filled cable stub. 4,216,369, Cl. 219-411.000.
Burton, Russell R.: *See*—
Shaffstall, Robert M.; Burton, Russell R.; and Jaggars, Jamy L., 4,215,712, Cl. 137-39.000.
Buten, Mioara R.: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.
Butler, Glenn A.: *See*—
Ludtke, Gerald W.; Butler, Glenn A.; and Krtous, George F., 4,216,506, Cl. 360-74.100.
Butler, Matthew T. Means for post-production film-making. 4,215,920, Cl. 352-92.000.
Buunk, Jan R.; Dorsemagen, Bernardus M. A.; and Van Dijkman, Johannes G. H., to U.S. Philips Corporation. Method of manufacturing an electric lamp. 4,215,456, Cl. 29-25.130.
Buxton, Robert B.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,216,497, Cl. 358-84.000.
Byers, James O., Jr., to Sanders Associates, Inc. Hydraulic velocity and acceleration control system. 4,215,623, Cl. 91-461.000.
C. A. Lawton Company: *See*—
Miller, John C., 4,215,543, Cl. 60-327.000.
C. R. Bard, Inc.: *See*—
Saylor, R. Glenn, 4,215,524, Cl. 53-554.000.
Cabot Corporation: *See*—
Hickl, Anthony J.; and Rosof, Barry H., 4,216,015, Cl. 75-134.00F.
Cadart, Francois; and Coulombeau, Alain, to Compagnie Generale des Etablissements Michelin. Electrochemical device with solid separator and solid electrolyte. 4,216,273, Cl. 429-50.000.
Cagle, George C.; and Bloom, Roger A., to Rockwell International Corporation. Means for deriving baud timing from an available AC signal. 4,216,543, Cl. 375-95.000.
Callet, Robert; and Jeantet, Henri, to Societe Anonyme des Imprimerie et Papeterie de l'Est. Deaerating valve for bagging pulverulent products. 4,215,725, Cl. 137-855.000.
Calloway Chemical Company: *See*—
Buckley, Herman T., 4,216,260, Cl. 428-261.000.
Calspan Corporation: *See*—
Weatherston, Roger C., 4,215,977, Cl. 418-1.000.
Calvert, John A., to United States of America, National Aeronautics and Space Administration. Redundant motor drive system. 4,215,592, Cl. 74-661.000.
Calvo, Luis C., to Germaine Monteil Cosmetiques Corp. Cosmetic emulsion compositions having skin moisturizing properties. 4,216,201, Cl. 424-63.000.
Camco, Incorporated: *See*—
Pace, Clare A.; and Pringle, Ronald E., 4,215,748, Cl. 166-322.000.
Cameron Iron Works, Inc.: *See*—
Cox, Fern H.; Taylor, William M.; and Just, Friedrich E., 4,215,747, Cl. 166-85.000.
Campbell, Neil E., to Lab Products, Inc. Animal feeding apparatus. 4,215,650, Cl. 119-18.000.
Campbell, Thomas C.; Hertzenberg, Elliot P.; and Sherry, Howard S., to PQ Corporation. Detergent compositions with silane-zeolite silicate builder. 4,216,125, Cl. 252-527.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Chan, Nelson, 4,215,833, Cl. 244-17.110.
Canada Square Management Ltd.: *See*—
Cooper, Kenneth R., 4,215,966, Cl. 414-173.000.
Canada Wire and Cable Limited: *See*—
Davis, H. John, 4,216,101, Cl. 252-63.200.
Cann, Peter L.; and Sacks, Paul S., to Carrier Corporation. Hot gas defrost system. 4,215,555, Cl. 62-324.000.
Canon Kabushiki Kaisha: *See*—
Date, Nobuaki; Aizawa, Hiroshi; and Hashimoto, Teiji, 4,215,925, Cl. 354-234.000.
Karasawa, Tamotsu; Kano, Ichiro; and Yoshinari, Hideki, 4,215,934, Cl. 355-51.000.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,215,588, Cl. 74-113.000.
Matsumoto, Kazuya, 4,215,924, Cl. 354-59.000.
Minoura, Kazuo, 4,215,912, Cl. 350-6.800.
Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,216,494, Cl. 358-55.000.
Sato, Tadashi; and Kubota, Atsushi, 4,215,929, Cl. 355-7.000.
Canterino, Peter J., to Mobil Oil Corporation. Process for solution polymerization of acrylonitrile. 4,216,301, Cl. 526-229.000.
Cantrell, Steven M.; and Keasler, Sydney J. Pumping rate control method and apparatus for internal combustion engine driven pumps. 4,215,974, Cl. 417-34.000.
Carcey, Jacques P., to Commissariat a l'Energie Atomique. Method and equipment for sintering under pressure. 4,216,017, Cl. 75-208.00R.
Caripolti, Richard A., to PPG Industries, Inc. Method for inserting electrodes into glass melting tanks. 4,215,461, Cl. 29-432.000.
Carl Zeiss-Stiftung: *See*—
Muchel, Franz; and Strahle, Fritz, 4,215,914, Cl. 350-175.0GN.
Carlson, Frank A., to Alton Box Board Company. Container for books and articles. 4,215,780, Cl. 206-424.000.
Carmosin, Richard J.: *See*—
Carson, John R.; Carmosin, Richard J.; and Stefanski, Anthony T., 4,216,150, Cl. 260-326.200.
Carnahan, James C., to General Electric Company. Aromatic polyformal carbonates and method for making. 4,216,305, Cl. 528-196.000.
Carney, Ronald E.; and McAlpine, James B., to Abbott Laboratories. Fortimicins AM and AP derivatives. 4,216,210, Cl. 424-180.000.
Carr, Uriah H. Hair shaping and lifting system. 4,215,709, Cl. 132-9.000.
Carrier Corporation: *See*—
Cann, Peter L.; and Sacks, Paul S., 4,215,555, Cl. 62-324.000.
Carroll, Cornelius F.; Abernathy, Lloyd E.; and Miller, Allen W. Arrow spacing screw for archery bow. 4,215,666, Cl. 124-41.00A.
Carson, John R.; Carmosin, Richard J.; and Stefanski, Anthony T., to McNeil Lab, Inc. Preparation of pyrrole-2-acetates. 4,216,150, Cl. 260-326.200.
Carstensen, Kenneth J.; and Staudt, John J., III, to Bob's Casing Crews. Power tongs. 4,215,602, Cl. 81-57.180.

Carter, Ernest A., to Motorola, Inc. Bus driver/latch with second stage stack input. 4,216,389, Cl. 307-247.00R.

Cartier, James E., to Saco Tanning Division of Kirstein Leather Co. Process for chrome recovery from industrial waste and the like, as from chrome-ladened tannery waste, including pollution control of the same. 4,215,989, Cl. 8-94.270.

Casady, Kent B.: *See*—
Batchelder, Clarence F.; and Casady, Kent B., 4,215,599, Cl. 81-52.40R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See*—
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; and Schraven, Eckhard, 4,216,314, Cl. 544-123.000.

Castelli, Pier G.: *See*—
Morello, Lorenzo; and Castelli, Pier G., 4,215,545, Cl. 60-413.000.

Castelli, Vittorio; Hamaker, Ralph A.; and Chai, Stephen T., to Xerox Corporation. Replenishable photoconductive system. 4,215,932, Cl. 355-16.000.

Caterpillar Tractor Co.: *See*—
Stambaugh, Gary E., 4,215,665, Cl. 123-198.00E.
Trittipoe, Jack H., 4,215,880, Cl. 285-61.000.

Cathodic Protection Services, Inc.: *See*—
Cherry, Raymond B; and Bash, Leroy A., 4,215,908, Cl. 339-96.000.

CBS Inc.: *See*—
Budelman, Gerald A.; and Turner, James A., 4,215,619, Cl. 84-1.280.

CECA S.A.: *See*—
Chahvekilian, Edgar; and Brouard, Rene, 4,216,077, Cl. 208-57.000.

Cenker, Moses: *See*—
Vogt, Herwart C.; Brizgys, Bernardas; Cenker, Moses; and Patton, John T., Jr., 4,216,107, Cl. 252-182.000.

Centrala Industriala de Medicamente Cosmetice Coloranti si Lacuri: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.

Centro Ricerche Fiat S.p.A.: *See*—
Morello, Lorenzo; and Castelli, Pier G., 4,215,545, Cl. 60-413.000.

Century 21 Pollution Control, Inc.: *See*—
Diachuk, Wolodymyr, 4,216,003, Cl. 55-356.000.

Chahvekilian, Edgar; and Brouard, Rene, to CECA S.A. Method of cracking under hydrogen pressure for the production of olefins. 4,216,077, Cl. 208-57.000.

Chai, Stephen T.: *See*—
Castelli, Vittorio; Hamaker, Ralph A.; and Chai, Stephen T., 4,215,932, Cl. 355-16.000.

Chamberlin, James W.: *See*—
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., 4,216,313, Cl. 544-55.000.

Chambley, Phillip W.; and Norris, Alan H., to WWG Industries Inc. Variable twist self-twist yarn. 4,215,642, Cl. 112-410.000.

Champion Chemicals, Inc.: *See*—
Clayton, Donald W., 4,216,249, Cl. 427-230.000.

Champion International Corporation: *See*—
Stillman, Nathan, 4,216,268, Cl. 428-424.800.
Vincent, David N.; and Chang, Cheng H., 4,216,112, Cl. 252-316.000.

Champness, Elwood. Drilling fluid cooling system. 4,215,753, Cl. 175-17.000.

Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Two coordinate position sensing systems. 4,216,352, Cl. 178-19.000.

Chan, Nelson, to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Cable-cutting device. 4,215,833, Cl. 244-17.110.

Chancel, Georges, to Crouzet. Magnetic information carrier. 4,215,812, Cl. 235-493.000.

Chang, Cheng H.: *See*—
Vincent, David N.; and Chang, Cheng H., 4,216,112, Cl. 252-316.000.

Charland, Roger. Vehicle frame pulling and reshaping apparatus. 4,215,849, Cl. 254-326.000.

Chas. A. Blatchford & Sons Limited: *See*—
Blatchford, Brian G.; and Woolnough, Victor J., 4,215,442, Cl. 3-22.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Chamuel, Jacques R., 4,216,352, Cl. 178-19.000.

Charlton, Steven D. Cue bridge. 4,215,859, Cl. 273-23.000.

Charvat, Charles J., to McGraw-Edison Company. Electric countertop cooking appliance. 4,216,370, Cl. 219-460.000.

Chasson, Louis; Euvrard, Raymond; and Romand, Paul, to Crouzet. Digital to synchro converter. 4,216,466, Cl. 340-347.0SY.

Chem-Y, Fabriek van Chemische Produkten, B.V.: *See*—
Smid, Jacob K., 4,216,156, Cl. 260-348.380.

Chemithon Corporation, The: *See*—
Brooks, Richard J.; and Brooks, Burton, 4,216,001, Cl. 55-240.000.

Chen, Alex C., to Consumers Glass Company Limited. Plastic containers and lids therefor. 4,215,797, Cl. 220-359.000.

Chenchick, Carl W.: *See*—
Shalhoob, William N.; Chenchick, Carl W.; and Kaspaul, Alfred F., 4,216,092, Cl. 210-222.000.

Cherry, Raymond B; and Bash, Leroy A., to Cathodic Protection Services, Inc. Arcless clamp connector. 4,215,908, Cl. 339-96.000.

Cherry, Sidney J.; Hruda, Robert M.; and Wayland, Paul O., to Westinghouse Electric Corp. Low voltage vacuum switch with internal arcing shield. 4,216,360, Cl. 200-144.00B.

Chevron Research Company: *See*—
Baardsen, Per, 4,215,952, Cl. 405-211.000.

Chia, E. Henry; and Schoerner, Roger J., to Southwire Company. Aluminum nickel base alloy electrical conductor and method therefor. 4,216,031, Cl. 148-2.000.

Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, to Commissariat a l'Energie Atomique; and Institut National de la Recherche Agronomique. Method and an installation for the air-conditioning of greenhouses and frames. 4,215,672, Cl. 126-419.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments of harmonic wave synthesizing type. 4,215,614, Cl. 84-1.010.

Chichester, Willard L., to Clark Equipment Company. Hydraulic control system. 4,215,622, Cl. 91-508.000.

Chin, Manuel G. Y.: *See*—
Gay, Derek J.; Trout, Robert G.; Chin, Manuel G. Y.; and Sawyer, James E., 4,215,843, Cl. 249-78.000.

Chirichigno, Jerry. Cable cover slitting tool. 4,215,470, Cl. 30-90.800.

Chittenden, Jimmie A., to Iowa Beef Processors, Inc. Flotation method and apparatus. 4,216,085, Cl. 210-44.000.

Chiu, Aurel: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.

Chiu, Sou-Hsiung J., to Control Data Corporation. Finite field multiplier. 4,216,531, Cl. 364-757.000.

Chiyoda Chemical Engineering & Construction Co., Ltd.: *See*—
Yoshida, Takechiyo; Ushiyama, Masato; and Yokoyama, Tohru, 4,216,118, Cl. 252-415.000.

Chizhov, Konstantin O.: *See*—
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; Peresada, Vitaly P.; and Chizhov, Konstantin O., 4,216,321, Cl. 544-349.000.

Chloride Silent Power Limited: *See*—
Bindin, Peter J., 4,215,466, Cl. 29-623.200.

Chr. Gfeller A.G.: *See*—
Gerber, Hansueli, 4,216,355, Cl. 179-18.0AB.

Christe, Karl O.: *See*—
Schack, Carl J.; and Christe, Karl O., 4,216,338, Cl. 560-227.000.

Christen, Wolfgang: *See*—
Seufert, Wilhelm; Gnadig, Gerhard; Przybylla, Fritz; Christen, Wolfgang; and Grimminger, Albert, 4,215,942, Cl. 366-343.000.

Ciavattoni, Anthony: *See*—
Cushman, Robert H.; Hart, Fred W., Jr.; Kircher, David R.; and Ciavattoni, Anthony, 4,216,383, Cl. 250-439.00P.

Ciba-Geigy AG: *See*—
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,216,320, Cl. 544-345.000.
Kitzing, Rainer; Whitear, Brian R. D.; Long, William E.; Reeves, David L. R.; and Wood, Glenn P., 4,216,146, Cl. 260-202.000.

Ciba-Geigy Corporation: *See*—
Gutekunst, Ferdinand; Lohse, Friedrich; and Schmid, Rolf, 4,216,304, Cl. 528-94.000.
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,216,155, Cl. 260-345.200.

Ciba-Geigy Ltd.: *See*—
Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, 4,215,782, Cl. 206-525.000.

CIR-S.p.A.-Divisione SASIB: *See*—
Manservisi, Renato, 4,215,774, Cl. 198-444.000.

Cities Service Company: *See*—
Newcombe, Jack, 4,216,079, Cl. 208-188.000.

Citizen Watch Co., Ltd.: *See*—
Mizukuchi, Yutaka, 4,216,109, Cl. 252-299.000.

Ciupe, Iuliu: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.

Claassen, Peter: *See*—
Krempl, Peter; Claassen, Peter; and List, Helmut, 4,216,403, Cl. 310-328.000.

Clardy, Edwin K.; and Ayers, Buell O., to Phillips Petroleum Company. Chromatographic analysis normalizer. 4,215,563, Cl. 73-23.100.

Clarion Co., Ltd.: *See*—
Amazawa, Kiyoshi; Mori, Masaharu; and Taniyama, Takashi, 4,216,430, Cl. 455-219.000.

Clark Equipment Company: *See*—
Chichester, Willard L., 4,215,622, Cl. 91-508.000.

Clark, Marion A. Positive shift derailleur mechanism. 4,215,872, Cl. 280-236.000.

Clauss, Richard J., to Oxy Metal Industries Corporation. Multiple zinc-containing coatings. 4,216,272, Cl. 428-632.000.

Clayton, Donald W., to Champion Chemicals, Inc. Method and means for coating the interior of a vertically disposed elongate hollow member. 4,216,249, Cl. 427-230.000.

Clayton, John P.; Rogers, Norman H.; and Coulton, Steven, to Beecham Group Limited. Antibacterial compounds. 4,216,223, Cl. 424-283.000.

Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., to Bell Telephone Laboratories, Incorporated; and Western Electric Co., Inc. MOS Dynamic memory in a diffusion current limited semiconductor structure. 4,216,489, Cl. 357-41.000.

Clift, Gunther K.; Young, David; and Fix, Brian S., to Cundell Corrugated Limited. Carton erecting apparatus. 4,215,522, Cl. 53-378.000.

Clover, Richmond B.; and Miller, George J., to Intel Magnetics Inc.; and Intel Corporation. Error repairing method and apparatus for bubble memories. 4,216,541, Cl. 371-38.000.

Coburn, Robert E.; and Buinewicz, Benedict R., to Molins Machine Company, Inc. Slitter scorer having upper and lower pairs of shafts selectively rotated by a single drive. 4,215,609, Cl. 83-492.000.

Cocron, Istvan: *See—*
Wagensonner, Eduard; and Cocron, Istvan, 4,216,418, Cl. 318-318.000.

Coe Manufacturing Company, The: *See—*
McMahon, Irven J., Jr., 4,215,489, Cl. 34-242.000.

Cohen, Ilan: *See—*
Hirsch, Mordechai; and Cohen, Ilan, 4,215,871, Cl. 279-48.000.

Cohen, Simon S. Solar energy collector and method of solar energy collection. 4,215,673, Cl. 126-419.000.

Coldren, Kenneth M.: *See—*
Bonomo, Melvin E.; Coldren, Kenneth M.; Rathbun, Loren L.; and Towner, Ronald D., 4,215,569, Cl. 73-134.000.

Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., to Beecham Group Limited. Pharmaceutical compositions. 4,216,232, Cl. 424-331.000.

Collen, Desire J., to Leuven Research & Development V.Z.W. Thrombosis-test. 4,216,291, Cl. 435-7.000.

Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., to Rod Pierce & Associates. Vending machine or the like with improved trap door type dispensing mechanism. 4,215,800, Cl. 221-129.000.

Colston, John R., to Westinghouse Electric Corp. Hand controller. 4,216,467, Cl. 340-365.00L.

Commissariat a l'Energie Atomique: *See—*
Carcey, Jacques P., 4,216,017, Cl. 75-208.00R.
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,215,672, Cl. 126-419.000.
Holzapfel, Georg; and Petel, Maurice, 4,216,124, Cl. 252-518.000.
Lemercier, Guy, 4,216,059, Cl. 176-87.000.
Levine, Simon; and Nakach, Alain, 4,216,258, Cl. 428-209.000.

Compagnie d'Electronique et de Piezoelectricite C.E.P.E.: *See—*
Marotel, Gerard, 4,216,371, Cl. 219-501.000.

Compagnie Generale des Etablissements Michelin: *See—*
Cadart, Francois; and Coulombeau, Alain, 4,216,273, Cl. 429-50.000.
Herbelleau, Yves, 4,215,736, Cl. 152-361.00R.

Compagnie Internationale pour l'Informatique: *See—*
Dupont, Jean, 4,216,421, Cl. 318-471.000.
Lazzari, Jean P.; and Desserre, Jean, 4,215,467, Cl. 29-841.000.

Concentric Production Research Limited: *See—*
George, Vivian C.; Webb, Cyril J.; and Whitmore, Roy, 4,215,954, Cl. 406-137.000.

Concord Laboratories, Inc.: *See—*
Raitto, Russell G., 4,215,701, Cl. 128-763.000.

Consumers Glass Company Limited: *See—*
Chen, Alex C., 4,215,797, Cl. 220-359.000.

Container Corporation of America: *See—*
Zicko, James A., 4,215,810, Cl. 229-33.000.

Continental Group, Inc., The: *See—*
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,215,648, Cl. 118-622.000.

Control Data Corporation: *See—*
Chiu, Sou-Hsiung J., 4,216,531, Cl. 364-757.000.
McSpadden, Jeff R., 4,216,540, Cl. 371-37.000.

Cook, Elton S.; and Fujii, Akira. Omega-amino acid ester hydrochlorides for treating bacterial infections. 4,216,227, Cl. 424-311.000.

Cooper Industries, Inc.: *See—*
Workman, William, Jr.; and Bos, John R., 4,215,594, Cl. 74-751.000.

Cooper, Kenneth R., to Canada Square Management Ltd. Material handling apparatus. 4,215,966, Cl. 414-173.000.

Cooper, Sidney; and Jacob, Ezekiel J., to Ani-Live Film Service Inc. Dry transfer of electrophotographic images. 4,216,283, Cl. 430-126.000.

Coste, Christian: *See—*
Pare, Maurice; and Coste, Christian, 4,216,096, Cl. 250-539.000.

Coster Tecnologie Speciali S.p.A.: *See—*
Giuffredi, Giancarlo, 4,215,804, Cl. 222-321.000.

Cotton Incorporated: *See—*
Mueller, K. Karl; and Lupton, Christopher J., 4,215,987, Cl. 8-115.000.

Cotton, William A.: *See—*
Williams, Robert A.; Cotton, William A.; and Hoskinson, Robert B., 4,215,831, Cl. 242-158.00F.

Coughenour, Donald J., to Singer Company, The. Buttonhole stitch method. 4,215,640, Cl. 112-264.100.

Coulombeau, Alain: *See—*
Cadart, Francois; and Coulombeau, Alain, 4,216,273, Cl. 429-50.000.

Coult, Joseph. Child's safety seat for vehicles. 4,215,900, Cl. 297-254.000.

Coulton, Steven: *See—*
Clayton, John P.; Rogers, Norman H.; and Coulton, Steven, 4,216,223, Cl. 424-283.000.

Couteau, Willy; and Ramioulle, Jean, to U C B, Societe Anonyme. Process for the production of methyl formate. 4,216,339, Cl. 560-232.000.

Cox, Fern H.; Taylor, William M.; and Just, Friedrich E., to Cameron Iron Works, Inc. Blowout preventer with tubing aligning apparatus. 4,215,747, Cl. 166-85.000.

Cox, Lloyd: *See—*
Garber, Esther B.; and Cox, Lloyd, 4,215,568, Cl. 73-73.000.

Craig, Robert S.: *See—*
Johnson, Calvin K.; and Craig, Robert S., 4,216,133, Cl. 260-38.000.

Crist, Ralph P., to United States of America, Navy. Expendable bathythermograph for use under ice. 4,215,571, Cl. 73-170.00A.

Crivello, James V., to General Electric Company. Heat curable cationically polymerizable compositions and method of curing same with onium salts and reducing agents. 4,216,288, Cl. 430-280.000.

Crompton & Knowles Corporation: *See—*
Steiner, Russel I., 4,216,248, Cl. 427-148.000.

Crook, Edward J., to American Hoist & Derrick Company. Method of field forming a loop splice for wire rope. 4,215,463, Cl. 29-461.000.

Crosno, Philip M.: *See—*
Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., 4,216,504, Cl. 358-8.000.

Cross, Kenneth O.: *See—*
Toth, Paul; and Cross, Kenneth O., 4,215,605, Cl. 82-40.00R.

Crouther, Ronald; Li, Vincent H.; and Dodge, Larry H., to Sherwood Medical Industries Inc. Blood collection device. 4,215,700, Cl. 128-763.000.

Crouzet: *See—*
Brozille, Jean-Yves, 4,216,358, Cl. 200-67.00D.
Chancel, Georges, 4,215,812, Cl. 235-493.000.
Chasson, Louis; Euvrard, Raymond; and Romand, Paul, 4,216,466, Cl. 340-347.0SY.

Crown Zellerbach Corporation: *See—*
Reba, Imants, 4,215,956, Cl. 406-152.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Garetti, Enzo; and Manfreddi, Renato, 4,216,532, Cl. 365-182.000.

Csiki, Kalman: *See—*
Lundin, Tord R.; and Csiki, Kalman, 4,215,683, Cl. 128-152.000.

Cullis, Herbert M.: *See—*
Terman, David S.; Sulliva, Michael; and Cullis, Herbert M., 4,215,688, Cl. 128-214.00R.

Cundari, Sante M.: *See—*
Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M., 4,216,041, Cl. 149-44.000.

Cundell Corrugated Limited: *See—*
Clift, Gunther K.; Young, David; and Fix, Brian S., 4,215,522, Cl. 53-378.000.

Cunningham, Donald R.; and Sulewsky, James E. Acoustical enclosure. 4,215,762, Cl. 181-201.000.

Cunningham, Douglas J., to Britax (Wingard) Ltd. Safety belt retractors. 4,215,830, Cl. 242-107.000.

Curran, Matthew J.: *See—*
Arendt, Ronald H.; and Curran, Matthew J., 4,216,278, Cl. 429-188.000.

Cushman, Robert H.; Hart, Fred W., Jr.; Kircher, David R.; and Ciavattoni, Anthony, to Pennwalt Corporation. Expeditious uni-directional panoramic dental radiography. 4,216,383, Cl. 250-439.00P.

Cyborex Laboratories, Inc.: *See—*
Emerson, Paul J.; and Hedges, Walter P., 4,216,527, Cl. 364-483.000.

Dadswell, John E.: *See—*
Henry, John; and Dadswell, John E., 4,215,757, Cl. 180-127.000.

Daeschner, John C., to Garrett Corporation, The. Turbocharger combustor system. 4,215,549, Cl. 60-606.000.

Dahlstrom, Baesley I.: *See—*
Hill, James E.; and Dahlstrom, Baesley I., 4,215,813, Cl. 235-448.000.

Dahms, Francis A., to Emhart Industries, Inc. Apparatus for straight line shearing. 4,215,611, Cl. 83-623.000.

Dahms, Ronald H., to Monsanto Company. Foamable resole resin composition. 4,216,295, Cl. 521-112.000.

Daiker, Artur L.: *See—*
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F., 4,215,562, Cl. 73-15.0FD.

Daimler-Benz Aktiengesellschaft: *See—*
Hoffmann, Rudiger; and Feichtiger, Dieter, 4,215,625, Cl. 92-48.000.

Dale, Glenn H: *See—*
Nielsen, Richard H.; McKay, Dwight L.; and Dale, Glenn H, 4,216,120, Cl. 252-430.000.

Dale, Johannes; and Borgen, Gerd. Process for complete or selective removal of salts from aqueous solution. 4,216,083, Cl. 210-31.00R.

Daley, William F.: *See—*
Stenzel, Reiner L.; and Daley, William F., 4,216,405, Cl. 313-310.000.

Damagnez, Jacques A.: *See—*
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,215,672, Cl. 126-419.000.

Dankert, Gerhard: *See—*
Lenthe, Manfred; and Dankert, Gerhard, 4,216,332, Cl. 548-337.000.

Danly Machine Corporation: *See—*
Novinger, Donald A., 4,215,732, Cl. 144-145.00A.

Dare, Roy R.; and Merten, Jeff L., to ACF Industries, Incorporated. Gate valve for shearing workover lines to permit shutting in of a well. 4,215,749, Cl. 166-361.000.

Dasek, Jaroslav; Shepherd, David; and Wood, Robert D., to Societe d'Assistance Technique pour Produits Nestle S.A. Elimination of flatulent sugars from soy. 4,216,235, Cl. 426-46.000.

Data Medical Associates, Inc.: *See—*
Sanders, James L., 4,215,993, Cl. 23-230.00B.

Date, Nobuaki; Aizawa, Hiroshi; and Hashimoto, Teiji, to Canon Kabushiki Kaisha. Photographic curtain-type shutter with electromagnetic actuation control. 4,215,925, Cl. 354-234.000.

Davenport, Donald E., to MB Associates. Apparatus and method for enhancing electrical conductivity of conductive composites and products thereof. 4,216,423, Cl. 320-1.000.

David Brown Gear Industries Limited: *See*—
Waterworth, Norman; Whateley, Eric A.; Shipley, Gerald A.; and McKnight, John, 4,215,755, Cl. 180-6.440.

Davidson, Hugh; Johnson, Keith T.; Leggeter, Brian E.; and Moore, Anthony J., to Hickson & Welch Limited. Compositions for the optical whitening of organic materials and use thereof. 4,216,105, Cl. 252-174.190.

Davis, Burns; and Shepherd, Freddie A., to Eastman Kodak Company. Molding composition comprising a blend of poly (tetramethylene terephthalate) and poly(tetramethylene terephthalate) modified with dimer acid. 4,216,129, Cl. 260-22.00D.

Davis, Charles I.: *See*—
Kubik, Donald A.; and Davis, Charles I., 4,215,682, Cl. 128-205.290.

Davis, Danny L., to Panzeca, Salvatore; Badalamenti, Michael; and Montalbano, Carlo, part interest to each. Pipe welding apparatus. 4,215,809, Cl. 228-48.000.

Davis, H. John, to Canada Wire and Cable Limited. Electrical insulating composition based on polyolefin containing dye additives as voltage stabilizers. 4,216,101, Cl. 252-63.200.

Davy Powergas, Inc.: *See*—
Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,216,189, Cl. 423-242.000.

Day, John W., executor: *See*—
Allen, Alfred E., Jr., deceased; and Day, John W., executor, 4,216,244, Cl. 426-649.000.

Dayco Corporation: *See*—
Howerton, Anderson W., 4,215,589, Cl. 474-62.000.

De Ambrosi, Luigi: *See*—
Fedeli, Gianfranco; and De Ambrosi, Luigi, 4,216,293, Cl. 435-268.000.

Deardorff, Paul A.; Wood, Robert C.; and Cundari, Sante M. Energy producing waste material composition and method of preparation. 4,216,041, Cl. 149-44.000.

Deavenport, Joe E.: *See*—
Huelsman, Kenneth A.; and Deavenport, Joe E., 4,216,465, Cl. 340-347.0AD.

De Barbieri, Augusto, to Proter S.p.A. N-Acyl derivatives of glucosamines having antitumor chemotherapeutic activity. 4,216,208, Cl. 424-177.000.

De Beul, Victor F.; and Van Hove, Jan H., to AGFA-GEVAERT N.V. Coating of viscous aqueous gelatin compositions on a continuous web support. 4,216,290, Cl. 430-496.000.

Debost, Robert, to Societe Nationale Elf Aquitaine (Production). Protection of stud-link chain-cables by means of soluble anodes. 4,216,070, Cl. 204-197.000.

DeCamilli, Franco, to Sisme Societa Italiana Statori Motori Electric S.p.A. Adjustable end-of-stroke device for dies for shaping the winding heads of electric motor stators. 4,215,561, Cl. 72-473.000.

Dedolph, Richard R., to Gravi-Mechanics Co. Field transplant systems and methods and components thereof. 4,215,513, Cl. 47-56.000.

De Feo, Carlo, to Industria Politecnica Meridionale S.p.A. Laminated spring for relays and three-way switches. 4,216,453, Cl. 335-133.000.

DeForrest, Allen L.: *See*—
Hagedorn, Thomas H.; and DeForrest, Allen L., 4,215,754, Cl. 177-137.000.

Degremont: *See*—
Pare, Maurice; and Coste, Christian, 4,216,096, Cl. 250-539.000.

de Lannoy, Jean, to U C B, Societe Anonyme. 1,3-Disubstituted (2-thio)ureas. 4,216,221, Cl. 424-274.000.

Delaporte, Jean-Charlemagne, to S.A. dite Compagnie Generale de Chauffe. Devices for heating premises by the use of heat pumps and method therefor. 4,215,817, Cl. 237-2.00B.

Delay, Calvin J. Remote control device for arc welding. 4,216,368, Cl. 219-132.000.

Delignieres, Robert, to Institut Francais du Petrole. Sonar for the topographic representation of a submerged surface and underlying strata. 4,216,537, Cl. 367-88.000.

DEMAG, Aktiengesellschaft: *See*—
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 4,215,852, Cl. 266-89.000.

de Meester, Emiel P. J.: *See*—
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,216,408, Cl. 313-468.000.

Demetrescu, Mihai C., to University of California, Regents of the. Aperiodic analysis system, as for the electroencephalogram. 4,215,697, Cl. 128-731.000.

Dempsey, Martin H.; and Rooney, James F., to Olin Corporation. High current cell-shorting switches. 4,216,364, Cl. 200-164.00R.

Denis, Pierre M.: *See*—
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,215,672, Cl. 126-419.000.

Dennhoven, Manfred: *See*—
Kunze, Claus; and Dennhoven, Manfred, 4,216,499, Cl. 358-111.000.

Dennison Manufacturing Company: *See*—
Ritter, Don D.; Patterson, Edwin A.; and Pigg, Henry M., 4,215,807, Cl. 227-21.000.

Deprez, Thomas A., to Gleason Works, The. Drive train for gear manufacturing machine. 4,215,959, Cl. 409-10.000.

De Rossi, Mario, to Metal Elio C.A. Una compania de acuerdo con las Leyes Venezolanas. Mixture regulating device. 4,215,661, Cl. 123-587.000.

DeSalle, Eugene J. Roll loader for roll manipulating machine. 4,215,970, Cl. 414-684.000.

Design Alliance, Inc.: *See*—
Mariol, James F., 4,215,509, Cl. 46-22.000.

Desserre, Jean: *See*—
Lazzari, Jean P.; and Desserre, Jean, 4,215,467, Cl. 29-841.000.

Dew-Hughes, David, to United States of America, Energy. Method of making V_3Ga superconductors. 4,215,465, Cl. 29-599.000.

D'Haussy, Philippe: *See*—
Ailloud, Pierre; and D'Haussy, Philippe, 4,216,063, Cl. 203-91.000.

Diachuk, Wolodymyr, to Century 21 Pollution Control, Inc. Gas cleaning system. 4,216,003, Cl. 55-356.000.

Diamant, Paul: *See*—
Bartheld, Robert G.; and Diamant, Paul, 4,216,399, Cl. 310-91.000.

Diamond, Julius; and Zalipsky, Jerome J., to William H. Rorer, Inc. Method for treating gastrointestinal hyperacidity or ulceration with amidinoureas. 4,216,229, Cl. 424-322.000.

Diamond, Julius; and Zalipsky, Jerome J., to William H. Rorer, Inc. Method for alleviating hypertension with amidinoureas. 4,216,230, Cl. 424-322.000.

Dias, Gil M., to United States of America, Army. Semi-durable, water repellant, fire resistant intumescent process. 4,216,261, Cl. 428-264.000.

Diaz, Ricardo A., to Westinghouse Electric Corp. Guidance control system for a traction vehicle. 4,215,759, Cl. 180-168.000.

Didier Engineering GmbH: *See*—
Blase, Manfred, 4,216,061, Cl. 202-248.000.

Diesel Kiki Co., Ltd.: *See*—
Nozaki, Shinya; and Suzuki, Shouichi, 4,215,662, Cl. 123-447.000.
Ohtani, Yoshio; and Kakishima, Todomu, 4,216,454, Cl. 335-262.000.

Di Fiore, Lucio: *See*—
Messina, Giuseppe; Lorenzoni, Loreno; and Di Fiore, Lucio, 4,216,345, Cl. 585-323.000.

DiGiacomo, Regis P.: *See*—
McGrath, William J.; and DiGiacomo, Regis P., 4,216,462, Cl. 340-150.000.

Dillon, Edward T.; and Duncan, Lloyd W., to NL Industries, Inc. Antifoulant additives for hydrocarbon streams. 4,216,076, Cl. 208-48.0AA.

Dinger, Hans; and Schulmeister, Robert, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Supercharged internal combustion engine and method of operation thereof. 4,215,550, Cl. 60-606.000.

Directed Energy Systems, Inc.: *See*—
Hurley, Frederick A., 4,216,384, Cl. 307-39.000.

Dittmann, Larry E.; and Webster, Van K., to AMP Incorporated. Battery terminal for telephone storage batteries. 4,215,911, Cl. 339-240.000.

Divjak, August A.; and Miczek, Peter, to Johnson Controls, Inc. Solid state motor control circuit providing a dynamic braking function. 4,216,422, Cl. 318-612.000.

Dobrjanskyj, Leo; and Simon, Donald R., to Singer Company, The. Electronic control of needle thread in a sewing machine. 4,215,641, Cl. 112-278.000.

Dockery, Denzel J. Under gravel aquarium filter. 4,216,090, Cl. 210-169.000.

Dr. E. Fresenius Chemisch Pharmazeutische Industrie KG Apparatebau KG: *See*—
Schindler, Johannes G.; and Riemann, Werner, 4,216,068, Cl. 204-195.00R.

Dodd, William A., Jr. Infusion and stirring device. 4,215,628, Cl. 99-323.000.

Dodge, Larry H.: *See*—
Crouther, Ronald; Li, Vincent H.; and Dodge, Larry H., 4,215,700, Cl. 128-763.000.

Doi, Tetsuo: *See*—
Matsuda, Yasumasa; Shimada, Satoshi; Kawakami, Kanji; Nishihara, Motohisa; Kohzuma, Taisaku; Sagae, Syoji; Doi, Tetsuo; and Yamada, Takahiro, 4,216,477, Cl. 346-140.00R.

Donabedian, Paul. Tray for the field drying of fruit. 4,215,488, Cl. 34-238.000.

Doner, Ralph L. Self-loading hay-bale-carrying trailer. 4,215,963, Cl. 414-24.500.

Dorn, Conrad P.; and Jones, Howard, to Merck & Co., Inc. Substituted mercapto acid amides and their use. 4,216,160, Cl. 260-455.00R.

Dorsemagen, Bernardus M. A.: *See*—
Buunk, Jan R.; Dorsemagen, Bernardus M. A.; and Van Dijkman, Johannes G. H., 4,215,456, Cl. 29-25.130.

Dove, Derek B., to University of Florida, Board of Regents, State of Florida, Tallahassee, Florida, for the use and benefit of the. Electrochromic display device. 4,215,918, Cl. 350-357.000.

Dow Chemical Company, The: *See*—
Flagg, Edward E., 4,216,316, Cl. 544-193.000.
Long, Ray S.; and Siemak, John B., 4,216,087, Cl. 210-58.000.
Miller, John A.; Brookshire, Phillip L.; and O'Neil, William J., Jr., 4,215,597, Cl. 81-9.10R.

Dowd, Theodore, to United States of America, Transportation. Method of detoxifying organotin-containing paint residues. 4,216,187, Cl. 423-98.000.

Draka Plastics B.V.: *See*—
Hackert, Benjamin M., 4,216,046, Cl. 156-252.000.

Drake, Charles A., to Phillips Petroleum Company. Two-stage catalytic hydrogenation of olefinically unsaturated dinitriles. 4,216,169, Cl. 260-583.00P.

Drouin, Morris J. Box for a pick-up vehicle. 4,215,896, Cl. 296-24.00R.

Duncan, Lloyd W.: *See—*
Dillon, Edward T.; and Duncan, Lloyd W., 4,216,076, Cl. 208-48.0AA.

Dunlap, Richard M., to United States of America, Navy. Compound aerostat of controllable altitude. 4,215,834, Cl. 244-97.000.

Du Pont de Nemours, E. I., and Company: *See—*
Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, 4,216,282, Cl. 430-39.000.
Lee, Kyu T., 4,216,324, Cl. 546-90.000.
Sandy, Charles A., 4,215,997, Cl. 44-68.000.
Wolf, Anthony D., 4,216,147, Cl. 260-207.000.

Dupont, Jean, to Compagnie Internationale pour l'Informatique. Apparatus and method for the thermal simulation of a constant load electric motor. 4,216,421, Cl. 318-471.000.

Durant, Graham J.: *See—*
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,216,318, Cl. 544-310.000.

Durst, Duane A.: *See—*
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,216,497, Cl. 358-84.000.

Dutton-Lainson Company: *See—*
Haase, Reinhold A.; Brockelsby, Norman D.; and Pike, Daniel W., 4,215,850, Cl. 254-350.000.

Duwel, Dieter: *See—*
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,216,161, Cl. 260-456.00A.

Dye, John A.: *See—*
Wahl, Roger L.; and Dye, John A., 4,215,823, Cl. 239-553.300.

Dynamit Nobel Aktiengesellschaft: *See—*
Steffen, Klaus D.; and Englaender, Fritz, 4,216,153, Cl. 260-343.30R.

Dynetics Engineering Corp.: *See—*
Hill, James E.; and Dahlstrom, Baesley I., 4,215,813, Cl. 235-448.000.

E M I Limited: *See—*
Karwowski, Wieslaw A., 4,216,526, Cl. 364-414.000.

E. R. Squibb & Sons, Inc.: *See—*
Krapcho, John; and Turk, Chester F., 4,216,335, Cl. 560-35.000.

E-Systems, Inc.: *See—*
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,216,497, Cl. 358-84.000.

E Z Paintr Corporation: *See—*
Burns, Fredrick B.; and Shaw, Richard J., 4,215,448, Cl. 15-210.00R.

Easter, Finis C., to RCA Corporation. Astable multivibrator circuit. 4,216,441, Cl. 331-111.000.

Eastman Kodak Company: *See—*
Davis, Burns; and Shepherd, Freddie A., 4,216,129, Cl. 260-22.00D.
Wang, Richard H. S.; and Irick, Gether, Jr., 4,216,137, Cl. 260-42.460.

Eaton Corporation: *See—*
Keane, William J.; and Mezak, John A., 4,216,447, Cl. 333-207.000.
Van Zeeland, Donald L., 4,216,515, Cl. 361-45.000.

Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, to Bayer Aktiengesellschaft. Process for applying a layer of a liquid foamable reaction mixture to a continuously moving shaping support. 4,216,181, Cl. 264-51.000.

Ebert, Edward A. Flue gas trap and diverter. 4,215,814, Cl. 236-1.00G.

Eblen, Ewald, to Robert Bosch GmbH. Fuel injection nozzle. 4,215,821, Cl. 239-533.400.

Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, to Du Pont de Nemours, E. I., and Company. AC corona to remove background from the imaging member of a magnetic copier. 4,216,282, Cl. 430-39.000.

Edwards, Jon L., to Texas Instruments Incorporated. Solid state switch. 4,216,458, Cl. 338-32.00H.

Eer Nisse, Errol P., to United States of America, Energy. Miniature quartz resonator force transducer. 4,215,570, Cl. 73-141.00R.

Egbert, Gary L.: *See—*
Jefferies, Robert K.; and Egbert, Gary L., 4,215,643, Cl. 114-218.000.

Ege, Gunther: *See—*
Weddigen, Gert; Ege, Gunther; and Vogtle, Friedrich, 4,216,276, Cl. 429-104.000.

Ehret, Gordon F.; Rowley, William N.; and Espiritu, Hermenegildo, to Wylain, Inc. Underwater light assembly with low-water cut-off. 4,216,411, Cl. 315-118.000.

Ehrgott, Frederick J.: *See—*
Klioze, Solomon S.; and Ehrgott, Frederick J., 4,216,218, Cl. 424-267.000.

Eide, Hans: *See—*
Humphries, Richard L.; and Eide, Hans, 4,215,781, Cl. 206-434.000.

Elettrocarbonium S.p.A.: *See—*
Genevois, Jean L.; Piva, Renato; and Lucia, Antonio, 4,215,982, Cl. 432-192.000.

Eli Lilly and Company: *See—*
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., 4,216,313, Cl. 544-55.000.

Elmore, James; and Ziel, Richard E., to Stanley Works, The. Cutting and abrading hand tool. 4,215,473, Cl. 30-172.000.

Elrich, Joshua D. Water pipe. 4,215,707, Cl. 131-173.000.

Elser, William F., to Owens-Illinois, Inc. End structure for a can body and method of making same. 4,215,795, Cl. 220-276.000.

Eltra Corporation: *See—*
Neilson, Peter J.; and Pickering, William J., 4,216,495, Cl. 358-80.000.

Elwood, Homer E.: *See—*
Holcombe, Brooks H.; and Elwood, Homer E., 4,215,668, Cl. 126-60.000.

Embach, James T.: *See—*
Antos, John M.; Henke, Arthur W.; Lindsay, Erin J.; and Embach, James T., 4,215,445, Cl. 4-323.000.

Embree, John M. Solar heating collector assembly. 4,215,675, Cl. 126-446.000.

Emerson Electric Co.: *See—*
Krump, Robert C., 4,215,815, Cl. 236-46.00R.

Emerson, Paul J.; and Hedges, Walter P., to Cyborex Laboratories, Inc. System for metering electrical energy with remote time signal correlation. 4,216,527, Cl. 364-483.000.

Emhart Industries, Inc.: *See—*
Dahms, Francis A., 4,215,611, Cl. 83-623.000.
Gerlach, John R., 4,215,557, Cl. 70-417.000.

Emmel, Ludwig; Rochling, Hans; and Seyfarth, Gunther, to Hoechst Aktiengesellschaft. Acaricidal and insecticidal compositions. 4,216,213, Cl. 424-219.000.

Energietechnik GmbH Studiengesellschaft fur Energie-Umwandlung- , -Fortleitung und -Anwendung: *See—*
Gobrecht, Heinrich F. H., 4,216,071, Cl. 204-242.000.

Engdahl, Jean, to Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services, S.A. Sealed piezoelectric resonator with integral mounting frame. 4,216,402, Cl. 310-320.000.

Englaender, Fritz: *See—*
Steffen, Klaus D.; and Englaender, Fritz, 4,216,153, Cl. 260-343.30R.

Enikolopov, Nikolai S.: *See—*
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zoris-lav N., 4,216,024, Cl. 106-308.00Q.

Envirotech Corporation: *See—*
Lombana, Luis A., 4,215,637, Cl. 110-225.000.
Perraud, Raymond J., 4,215,953, Cl. 405-303.000.
Solum, Dallas H., 4,216,094, Cl. 210-331.000.

Epik, Alexei P.: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.

Erfurt, Werner E.: *See—*
Heine, Helmut A.; and Erfurt, Werner E., 4,215,678, Cl. 128-6.000.

Erickson, Donald C. Hydrogen production from carbonaceous fuels using intermediate oxidation-reduction. 4,216,199, Cl. 423-657.000.

Erickson, Donald P., to Rocky Mountain Sheet Metal Company, Inc. Solar collector panel assembly. 4,215,677, Cl. 126-450.000.

Escue, Jesse W. Rotatable shaft seal. 4,215,870, Cl. 277-93.00R.

Esler, Thomas C., to Stofan, Joseph M., a part interest. Belt conveyor idler. 4,215,776, Cl. 198-823.000.

Espiritu, Hermenegildo: *See—*
Ehret, Gordon F.; Rowley, William N.; and Espiritu, Hermenegildo, 4,216,411, Cl. 315-118.000.

Etablissement Dentaire Ivoclar: *See—*
Madlener, Bruno, 4,215,985, Cl. 433-90.000.

Esteban, Daniel J.; Galand, Claude R.; Mauduit, Daniel; and Menez, Jean, to International Business Machines Corporation. Process for compressing data relative to voice signals and device applying said process. 4,216,354, Cl. 179-15.55R.

Esteve Soler, Jose: *See—*
Esteve Subirana, Antonio; and Esteve Soler, Jose, 4,216,214, Cl. 424-244.000.

Esteve Subirana, Antonio; and Esteve Soler, Jose, to PRODESIN (Productos Esteve Internacional S.A.). 4-Tert. butyl-3'-chlorodiphenylamine derivatives, their preparation and their application as anti-histaminic drugs. 4,216,214, Cl. 424-244.000.

Eta A. G. Ebauches-Fabrik: *See—*
Perrot, Frieddrich, 4,215,532, Cl. 368-168.000.

Eurometaal N.V.: *See—*
Sie, Swan L., 4,215,632, Cl. 102-92.700.

Euteco S.p.A.: *See—*
Messina, Giuseppe; Lorenzoni, Loreno; and Di Fiore, Lucio, 4,216,345, Cl. 585-323.000.

Euvrard, Raymond: *See—*
Chasson, Louis; Euvrard, Raymond; and Romand, Paul, 4,216,466, Cl. 340-347.0SY.

Evans, Francis E.; Lind, Charles J.; and Robinson, Martin A., to Allied Chemical Corporation. Preparation of high purity tetrahydrocarbylammonium tetrahydridoborates. 4,216,168, Cl. 260-567.60M.

Evans, William E.; and Viezee, William, to SRI International. Visibility monitor employing television camera. 4,216,498, Cl. 358-93.000.

Everson, William, to Perkasie Industries Corporation. Auxilliary window for industrial and commercial applications. 4,215,517, Cl. 52-202.000.

Excelermatic, Inc.: *See—*
Kraus, Charles E., 4,215,595, Cl. 74-798.000.

Exploration Logging, Inc.: *See—*
More, Henry S., 4,216,536, Cl. 367-83.000.

Exxon Research & Engineering Co.: *See*—
Klemann, Lawrence P.; and Stogryn, Eugene L., 4,216,191, Cl. 423-364.000.
Plumlee, Karl W.; and Vernon, Lonnie W., 4,216,078, Cl. 208-143.000.
Rao, Bhaskara M. L.; and Klemann, Lawrence P., 4,216,192, Cl. 423-366.000.

Ezoe, Mituhiko: *See*—
Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.

F. Jos. Lamb Company: *See*—
Graham, James T., 4,215,772, Cl. 193-35.00A.
Jones, Robert P., 4,215,603, Cl. 82-1.300.

Fairfield Engineering Company, The: *See*—
Hines, David M.; and Waring, Charles D., 4,215,579, Cl. 73-424.000.

Falb, Richard D.: *See*—
Bremer, Roger E.; and Falb, Richard D., 4,215,696, Cl. 128-641.000.

Falk, Earl E.: *See*—
Powell, John L.; Rekemeyer, Peter C.; and Falk, Earl E., 4,216,053, Cl. 159-48.00R.

Farace, Louis P., to United States of America, Army. Safe and arming device. 4,215,635, Cl. 102-238.000.

Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, to Philagro. Herbicidal and phytohormonal amidoximes. 4,216,006, Cl. 71-88.000.

Farkas, Ferenc: *See*—
Onodi, Zoltan; Mikola, Sandor; Farkas, Ferenc; and Kovacs, Istvan, 4,215,487, Cl. 34-167.000.

Farmitalia Carlo Erba S.p.A.: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,216,157, Cl. 260-365.000.

Farrand, Clair L.; Foster, Vincent F.; and Grace, William H., to Farrand Industries, Inc. Method and apparatus for correcting the error of a position measuring interferometer. 4,215,938, Cl. 356-358.000.

Farrand Industries, Inc.: *See*—
Farrand, Clair L.; Foster, Vincent F.; and Grace, William H., 4,215,938, Cl. 356-358.000.

Farrell, Eugene A.; and Montante, Louis L., to Frink Sno-Plows. Automatic locking mechanism for vehicular mounted snowplow. 4,215,494, Cl. 37-42.00R.

Fedeli, Gianfranco; and De Ambrosi, Luigi, to Laboraton Derivati Organici, S.p.A. Extracting protease-inhibitor from animal tissue containing same. 4,216,293, Cl. 435-268.000.

Feichtiger, Dieter: *See*—
Hoffmann, Rudiger; and Feichtiger, Dieter, 4,215,625, Cl. 92-48.000.

Feldstein, Robert S. Emergency lighting system. 4,216,410, Cl. 315-86.000.

Feneberg, Paul; Konigl, Georg; Kirchhof, Gunther; and Schatz, Anton, to AGFA-Gevaert, A.G. Projection system for copying machines. 4,215,933, Cl. 355-50.000.

Ferguson, Walter D.: *See*—
Bell, Billy W.; and Ferguson, Walter D., 4,215,916, Cl. 350-319.000.

Fernandez, Emile C. Method of making a translucent optical diffuser for a lamp. 4,215,462, Cl. 29-448.000.

Ferro Corporation: *See*—
Kinstle, George P., 4,216,023, Cl. 106-293.000.

Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, to Swiss Aluminium Ltd.; and Ciba-Geigy Ltd. Non-returnable container, comprising at least two dish-shaped parts joined together. 4,215,782, Cl. 206-525.000.

Fewell, William B. Braille deaf-blind communicators. 4,215,490, Cl. 35-35.00A.

Fiat Auto S.p.A.: *See*—
Burgio, Antonio, 4,215,657, Cl. 123-269.000.

Fiber Materials, Inc.: *See*—
Marangoni, Roy D.; Gigerenzer, Horst; and Pepper, Roger T., 4,215,764, Cl. 181-286.000.

Fields, Ronald H.; and McLeod, Allan G. Horseshoe. 4,215,750, Cl. 168-4.000.

Finlayson, Claude M., to NL Industries, Inc. Organophilic clays and thixotropic polyester compositions containing the same. 4,216,135, Cl. 260-40.00R.

Finley, Donald G. Internal combustion engine. 4,215,660, Cl. 123-78.00E.

Finzer, Heinz. Resistance welder with a cutter. 4,216,366, Cl. 219-78.150.

Firestone Tire & Rubber Company, The: *See*—
Kay, Edward L., 4,216,126, Cl. 260-5.000.

Fischer, Wilfried: *See*—
Hartmann, Bernd; Haar, Wilhelm; Fischer, Wilfried; and Bauer, Roland, 4,216,275, Cl. 429-104.000.

Fish, Lawrence W., Jr., to McIntosh Laboratory, Inc. Adaptive multiplex blend control for stereo decoder to maintain signal to noise ratio. 4,216,353, Cl. 179-1.0GJ.

Fisher, John H.; Bradbrook, John D.; and Bassett, Peter J., to James Neill Holdings Limited. Distance measuring gauge. 4,215,480, Cl. 33-125.00C.

Fix, Brian S.: *See*—
Clift, Gunther K.; Young, David; and Fix, Brian S., 4,215,522, Cl. 53-378.000.

Flagg, Edward E., to Dow Chemical Company, The. Process for the production of alkyl cyanates and oligomers. 4,216,316, Cl. 544-193.000.

Flickshu, Peter; and Wenzel, Diethard, to Blaupunkt Werke GmbH. Method and apparatus of communicating emergency signals from a transceiver in a transceiver communication network, particularly for citizen-band emergency use. 4,216,545, Cl. 455-77.000.

Flintoff, John F.: *See*—
Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,216,189, Cl. 423-242.000.

Flora, Laurence P., to Burroughs Corporation. Self-clocked data transmission system having automatic signal reversing means. 4,216,426, Cl. 455-28.000.

Flora, Lawrence; and Francis, Marion D., to Procter & Gamble Company, The. Pyrazolidine anti-inflammatory composition and methods of use. 4,216,212, Cl. 424-204.000.

Florida East Coast Railway Company: *See*—
Smith, Irving E., 4,215,636, Cl. 104-17.00R.

Flygstad, Dean W.; and Petelle, James F., to Telex Communications, Inc. Automatic tape player-changer. 4,216,507, Cl. 360-92.000.

Fodor, William G., to Sandvik, Inc. Rake. 4,215,528, Cl. 56-400.170.

Ford Motor Company: *See*—
Ulics, George, 4,215,898, Cl. 296-183.000.

Formeloza, Elizabeth F.: *See*—
Barrett, John H., Jr.; and Formeloza, Elizabeth F., 4,215,990, Cl. 8-107.000.

Forsberg, John D., to United States of America, Air Force. Mechanical munition flight environment sensor. 4,215,634, Cl. 102-228.000.

Fosdick, Dale P.: *See*—
Rosaen, Borje O.; and Fosdick, Dale P., 4,215,718, Cl. 137-543.190.

Foster, Vincent F.: *See*—
Farrand, Clair L.; Foster, Vincent F.; and Grace, William H., 4,215,938, Cl. 356-358.000.

Fox, Edward C., to RCA Corporation. Peak detector circuit. 4,216,502, Cl. 358-176.000.

Fox, Robert J.: *See*—
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,216,375, Cl. 235-382.000.

Francis, Marion D., to Procter & Gamble Company, The. Therapeutic composition. 4,216,211, Cl. 424-204.000.

Francis, Marion D.: *See*—
Flora, Lawrence; and Francis, Marion D., 4,216,212, Cl. 424-204.000.

Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic generators with an inverter feeding its high voltage transformer. 4,216,382, Cl. 250-408.000.

Franken, Adrianus J. J.: *See*—
Brehm, Rudolf; and Franken, Adrianus J. J., 4,216,004, Cl. 65-2.000.

Franz, James H., Jr.: *See*—
Anderson, Larry W.; Franz, James H., Jr.; and Matty, Thomas C., 4,216,417, Cl. 318-274.000.

Frazier, Paul D. Orthodontic headgear appliance safety system. 4,215,983, Cl. 433-5.000.

Frederiksen, Sven C.: *See*—
Rothman, Ulf S. E.; Frederiksen, Sven C.; and Leube, Bernt O., 4,215,693, Cl. 128-296.000.

Freeman Chemical Corporation: *See*—
Boeckeler, Rudolph H., 4,216,306, Cl. 528-115.000.

Freiberg, Gunter, to AGFA-Gevaert, A.G. Objective lens holding arrangement for a micro-film reader. 4,215,915, Cl. 350-255.000.

Freitag, Dieter: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.

Freudewald, Joachim E.: *See*—
Virgilio, Joseph A.; and Freudewald, Joachim E., 4,216,342, Cl. 568-755.000.

Freundlinger, Ernst: *See*—
Hirschvogel, Alfred; and Freundlinger, Ernst, 4,216,266, Cl. 428-408.000.

Frey, James A.: *See*—
Paranjpe, Suresh C.; and Frey, James A., 4,216,479, Cl. 346-75.000.

Friedrich Kocks GmbH & Company, Firma: *See*—
Zacharias, Theodor, 4,215,855, Cl. 266-259.000.

Friemel, Wolfgang F.: *See*—
Allen, James R.; and Friemel, Wolfgang F., 4,215,508, Cl. 43-125.000.

Frink Sno-Plows: *See*—
Farrell, Eugene A.; and Montante, Louis L., 4,215,494, Cl. 37-42.00R.

Fritz, Ulrich; Kamm, Willibald; Kipp, Thorwald; and Sudmersen, Udo, to Weserhutte Aktiengesellschaft. Crusher with impacting bars. 4,215,825, Cl. 241-34.000.

Fuji Kogyo K.K.: *See*—
Ohmura, Ryuichi, 4,215,504, Cl. 43-24.000.

Fuji Mgf. Co., Ltd.: *See*—
Asai, Koichi; and Kawada, Tousuke, 4,215,469, Cl. 29-835.000.

Fuji Photo Film Co., Ltd.: *See*—
Oda, Kazutaka; and Okishi, Yoshio, 4,216,289, Cl. 430-302.000.
Sakai, Tadao; Kawai, Masayoshi; and Shishido, Tadao, 4,216,284, Cl. 430-140.000.

Fuji Telecasting Co., Ltd.: *See*—
Iwasaki, Norio; Satoh, Toshio; Ito, Hiroyuki; and Koike, Ikuya, 4,216,357, Cl. 179-100.10R.

Fujii, Akira: *See*—
Cook, Elton S.; and Fujii, Akira, 4,216,227, Cl. 424-311.000.
Fujii, Etsuo: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,215,902, Cl. 303-119.000.
Fujishiro, Koretoshi: *See*—
Murata, Hidemi; Fujishiro, Koretoshi; Hiraga, Shunsaku; and Hiyoshi, Masamitu, 4,216,060, Cl. 202-139.000.
Fujishiro, Takeshi: *See*—
Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.
Fujita, Hisanori: *See*—
Hasegawa, Shinichi; and Fujita, Hisanori, 4,216,484, Cl. 357-17.000.
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, to TDK Electronics Co., Ltd. High dielectric constant type ceramic composition consisting essentially of $Pb(Fe_{\frac{1}{4}}Nb_{\frac{1}{4}})O_3$-$Pb(Mg_{\frac{1}{4}}Ta_{\frac{1}{4}})O_3$. 4,216,103, Cl. 252-63.200.
Fujiwara, Shinobu: *See*—
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,102, Cl. 252-63.200.
Fukasawa, Noburu, to Nissan Motor Company, Limited. Indicator gauge with illuminated pointer. 4,215,647, Cl. 116-286.000.
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, to Meiji Seika Kaisha, Ltd. Antiviral agent and treatment of viral infections. 4,216,226, Cl. 424-311.000.
Funke, Siegfried: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, to TDK Electronics Co., Ltd. High dielectric constant type ceramic composition consisting essentially of $Pb(Fe_{1/2}Nb_{1/2})O_3$-$Pb(Mg_{1/3}Nb_{2/3})O_3$. 4,216,102, Cl. 252-63.200.
Furukawa, Kiyoshi: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.
Furuta, Akihiro: *See*—
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, 4,216,287, Cl. 430-271.000.
Futaba Denshi Kogyo K. K.: *See*—
Kishino, Takao; Yamaguchi, Nobuo; and Mera, Yoichi, 4,216,470, Cl. 340-753.000.
Futami, Hideo. Catalyst and process for production of methane-containing gases. 4,215,998, Cl. 48-214.00A.
G-P Manufacturing Co., Inc.: *See*—
Price, Harold, 4,215,873, Cl. 280-153.00R.
Gabalda, Carlos M.: *See*—
Beau, Patrick; and Gabalda, Carlos M., 4,215,530, Cl. 57-310.000.
Gabriel, Gifford W., Jr. Self contained asphalt patching apparatus. 4,215,949, Cl. 404-110.000.
GAF Corporation: *See*—
Lorenz, Donald H.; Tu, Shu T.; and Wyman, Donald P., 4,216,267, Cl. 428-412.000.
Schneider, Louis; and Graham, David E., 4,216,152, Cl. 260-326.50S.
Galand, Claude R.: *See*—
Esteban, Daniel J.; Galand, Claude R.; Mauduit, Daniel; and Menez, Jean, 4,216,354, Cl. 179-15.55R.
Galyean, Robert F.: *See*—
Rivier, Jean E. F.; and Galyean, Robert F., 4,216,141, Cl. 260-112.50R.
Ganellin, Charon R.: *See*—
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,216,318, Cl. 544-310.000.
Garber, Esther B.; and Cox, Lloyd, to United States of America, Army. Rapid water activity determining device and method. 4,215,568, Cl. 73-73.000.
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator. Apparatus for explosive application of coatings to articles. 4,215,819, Cl. 239-81.000.
Garetti, Enzo; and Manfreddi, Renato, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Self-correcting solid-state mass memory organized by words for a stored-program control system. 4,216,532, Cl. 365-182.000.
Garlock Inc.: *See*—
Pendleton, Darrell D., 4,215,869, Cl. 277-12.000.
Garrett Corporation, The: *See*—
Daeschner, John C., 4,215,549, Cl. 60-606.000.
Garrett, Thomas C.: *See*—
Raymond, Douglas W.; and Garrett, Thomas C., 4,216,539, Cl. 371-20.000.
Garriss, John E. Energy conserving laboratory hood system. 4,215,627, Cl. 98-115.0LH.
Gartland, Jean G., executor: *See*—
Gartland, William T., deceased; and Gartland, Jean G., executor, 4,215,447, Cl. 8-156.000.
Gartland, William T., deceased; and by Gartland, Jean G., executor. Process and apparatus for washing fibre stock in the de-inking of paper. 4,215,447, Cl. 8-156.000.
Gates Rubber Company, The: *See*—
Uba, Toshio, 4,216,277, Cl. 429-175.000.
Gaule, Gerhard K.; Yarwood, John C.; and Tyler, Derek E., to Olin Corporation. Anti-parallel inductors for shape control in electromagnetic casting. 4,215,738, Cl. 164-49.000.
Gavin, Douglas L.; and Parmelee, Edward E. Pick-up device. 4,215,888, Cl. 294-1.00B.
Gavlefors, Nils L.: *See*—
Holma, Johan E.; Andersson, Ake A.; and Gavlefors, Nils L., 4,215,957, Cl. 407-114.000.
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F. Method for detecting surface and subsurface flaws in rolled products. 4,215,562, Cl. 73-15.0FD.
Gay, Derek J.; Trout, Robert G.; Chin, Manuel G. Y.; and Sawyer, James E., to Mattel, Inc. Toy molding apparatus and material for use therewith. 4,215,843, Cl. 249-78.000.
Gaylord, James K. Air-fuel inlet device for internal combustion engines. 4,215,663, Cl. 123-590.000.
Gazzard, Warwick H.; and Kearin, Roger M., to James Hardie & Coy. Pty. Limited. Embossed patterning of asbestos-cement and like sheets. 4,216,043, Cl. 156-193.000.
Gebert, Ulrich: *See*—
Weber, Rolf-Ortwin; Anagnostopulos, Hiristo; and Gebert, Ulrich, 4,216,216, Cl. 424-251.000.
Gebhardt, Elfriede, heiress: *See*—
Gebhardt, Richard, deceased; and Gebhardt, Elfriede, heiress, 4,215,775, Cl. 198-781.000.
Gebhardt, Richard, deceased; and by Gebhardt, Elfriede, heiress. Roller conveyor for conveying and pressure-free accumulation of individual items. 4,215,775, Cl. 198-781.000.
Gebruder Loepfe AG: *See*—
Weidman, Erich; and Graf, Walter, 4,215,728, Cl. 139-370.200.
Geddes, John J., to Honeywell Inc. Light emitting and light detecting semiconductor device for interfacing with an optical fiber. 4,216,486, Cl. 357-19.000.
Gehrig, Wilfried W.; and Grosse, Joachim, to ITT Industries, Incorporated. Circuit arrangement for generating a binary-coded pulse train. 4,216,391, Cl. 307-265.000.
Gehweiler, Edward C., to W. H. Brady Co. Separating laminated layers. 4,216,048, Cl. 156-344.000.
Gemmel, Goran; Aslund, Christer; and Solly, Barry. Ductile ferritic steels and their use for metallic articles, especially welded constructions. 4,216,013, Cl. 75-125.000.
General Atomic Company: *See*—
Krystek, Michael S.; Hurley, George L., III; Smith, Steven R.; and Rice, Stephen E., 4,216,529, Cl. 364-510.000.
General Dynamics Corporation: *See*—
Speicher, John M., 4,215,906, Cl. 308-235.000.
General Dynamics Corporation Pomona Division: *See*—
Hagelberg, Allen C.; and Lobitz, Walter A., 4,215,630, Cl. 102-10.000.
General Electric Company: *See*—
Arendt, Ronald H.; and Curran, Matthew J., 4,216,278, Cl. 429-188.000.
Carnahan, James C., 4,216,305, Cl. 528-196.000.
Crivello, James V., 4,216,288, Cl. 430-280.000.
Howell, Edward K., 4,216,516, Cl. 361-45.000.
Johnston, Robert A.; and Keesee, Wallace G., 4,215,796, Cl. 220-306.000.
Lange, Kai, 4,216,381, Cl. 250-363.00S.
McGrath, William J.; and DiGiacomo, Regis P., 4,216,462, Cl. 340-150.000.
Miller, Sammy L., 4,215,464, Cl. 29-596.000.
Moeller, Richard E., 4,216,252, Cl. 427-387.000.
Pasko, Walter J., 4,215,763, Cl. 181-202.000.
Pohl, Walter J., 4,215,554, Cl. 62-156.000.
Tassie, Douglas P.; and Pustell, Robert A., 4,215,620, Cl. 86-1.00R.
General Foods Limited: *See*—
Newman, Alec T.; and Rhodes, David, 4,215,801, Cl. 222-63.000.
General Pneumatics Corporation: *See*—
Raskin, Paul, 4,215,715, Cl. 137-505.180.
General Research of Electronics, Inc.: *See*—
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,216,432, Cl. 455-79.000.
General Signal Corporation: *See*—
Becker, Lanson, 4,215,720, Cl. 137-596.200.
Wium, Eigil, 4,216,349, Cl. 174-50.000.
Genesi, Robert C., to Sprague Electric Company. Low voltage bias circuit for a photo-diode. 4,216,379, Cl. 250-214.00P.
Genevois, Jean L.; Piva, Renato; and Lucia, Antonio, to Elettrocarbonium S.p.A. Continuous ring furnaces for baking and rebaking carbon articles. 4,215,982, Cl. 432-192.000.
Genter, Claude: *See*—
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.
Georg Fischer Aktiengesellschaft: *See*—
Lustenberger, Hans, 4,215,854, Cl. 266-240.000.
Georg Fischer Limited: *See*—
Trosch, Paul, 4,215,717, Cl. 137-533.250.
George, Vivian C.; Webb, Cyril J.; and Whitmore, Roy, to Concentric Production Research Limited. Workpiece disentangler. 4,215,954, Cl. 406-137.000.

Gerber, Hansueli, to Chr. Gfeller A.G. Telephone line monitoring apparatus. 4,216,355, Cl. 179-18.0AB.

Gerbracht, Osceola J., to Norfin, Inc. Cable winding apparatus. 4,215,529, Cl. 57-6.000.

Gergely, Gerhard. Process of manufacturing a gas-generating cleaning material. 4,216,104, Cl. 252-91.000.

Gerlach, John R., to Emhart Industries, Inc. Lock with key slot manipulation barrier. 4,215,557, Cl. 70-417.000.

Germaine Monteil Cosmetiques Corp.: *See*—
Calvo, Luis C., 4,216,201, Cl. 424-63.000.

Gerow, Joyce M.: *See*—
Waller, Gail J., 4,215,752, Cl. 169-58.000.

Gerow, Kenneth W.: *See*—
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Gerry, Martin E. Transient modulated AC ignition system. 4,216,412, Cl. 315-209.00T.

GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Aktiengesellschaft: *See*—
Blaimschein, Gottfried, 4,215,604, Cl. 82-20.000.

Ghahramani, Iraj, to International Telephone and Telegraph Corporation. Densitometer with voltage driver. 4,215,566, Cl. 73-32.00A.

Giannetti, Anthony. Shower boot. 4,215,491, Cl. 36-8.100.

Gibran, Kahlil. Tripod. 4,215,839, Cl. 248-170.000.

Giedd, Gary R.; Karsch, Arthur F.; and Lindauer, Sydney L., to International Business Machines Corporation. Thermal strip chart recorder. 4,216,478, Cl. 346-61.000.

Gigerenzer, Horst: *See*—
Marangoni, Roy D.; Gigerenzer, Horst; and Pepper, Roger T., 4,215,764, Cl. 181-286.000.

Giglia, Robert D.; and Reddy, Thomas B., to American Cyanamid Company. Ion exchange-electrolyte layer for electrochromic devices. 4,215,917, Cl. 350-357.000.

Gillberg, James E.; and Kucharewski, Nicholas, to RCA Corporation. Drive circuit for controlling current output rise and fall times. 4,216,393, Cl. 307-270.000.

Gilliam, George A. Frame arms for solar collector. 4,215,676, Cl. 126-448.000.

Gishin, Stoyan S.: *See*—
Penchev, Peter R.; and Gishin, Stoyan S., 4,216,064, Cl. 204-1.00T.

Giuffredi, Giancarlo, to Coster Tecnologie Speciali S.p.A. Manual control dispensing pump for liquid containers. 4,215,804, Cl. 222-321.000.

Giulianotto, Louis, to Agence Nationale de Valorisation de la Recherche (ANVAR). Method and apparatus for manufacturing articles made of paper from a plurality of pre-perforated strips. 4,215,626, Cl. 93-94.00R.

Givaudan Corporation: *See*—
Virgilio, Joseph A.; and Freudewald, Joachim E., 4,216,342, Cl. 568-755.000.

Gladieux, Norman K.; Allen, Carey M.; and Koralewski, Thomas J., to Libbey-Owens-Ford Company. Glass conveying roll and a method of forming it. 4,216,005, Cl. 65-374.00R.

Gleason Works, The: *See*—
Deprez, Thomas A., 4,215,959, Cl. 409-10.000.

Gloppestad, Einar, to Alfa-Laval AB. Process for recovering meal and fat from animal raw materials. 4,216,239, Cl. 426-456.000.

Gnadig, Gerhard: *See*—
Seufert, Wilhelm; Gnadig, Gerhard; Przybylla, Fritz; Christen, Wolfgang; and Grimminger, Albert, 4,215,942, Cl. 366-343.000.

Goan, John C., to Great Lakes Carbon Corporation. Surface treatment of carbon fibers. 4,216,262, Cl. 428-367.000.

Gobrecht, Heinrich F. H., to Energietechnik GmbH Studiengesellschaft fur Energie-Umwandlung- , -Fortleitung und -Anwendung. Electrodeposition cell. 4,216,071, Cl. 204-242.000.

Godeux, Michel, to Patalidis, Claude A., a part interest. Indication of the momentary value of liquid level. 4,215,574, Cl. 73-314.000.

Goelz, David W.: *See*—
Hetherington, Robert D.; and Goelz, David W., 4,215,721, Cl. 137-606.000.

Goettsch, Reijer; and Jetten, Arnold G. M., to Stamicarbon, B.V. Process for the recovery of 2-pyrrolidone. 4,216,151, Cl. 260-326.5FN.

Gold, Barry L.; and Bolesky, Richard C., to Zimmer, USA. Semi-restraining knee prosthesis. 4,215,439, Cl. 3-1.911.

Goldfischer, Lester I.; Stavis, Gus; and Shrekenhamer, Abraham, to Singer Company, The. MIPS Hover attachment. 4,216,473, Cl. 343-8.000.

Goldstein, Arthur L., to Ionics Inc. Ion exchange resin containing activated carbon. 4,216,073, Cl. 204-296.000.

Gonzalez-Dorner, Alberto C.: *See*—
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.

Goodyear Tire & Rubber Company, The: *See*—
Kifor, Harry T., 4,215,459, Cl. 29-426.100.
Kline, Richard H., 4,216,116, Cl. 252-404.000.
Miller, Donald E., 4,216,115, Cl. 252-400.00R.

Gordon, Donald W. Athlete's landing pit. 4,215,857, Cl. 272-101.000.

Gorondy, Emery J.: *See*—
Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, 4,216,282, Cl. 430-39.000.

Gottsmann, Helmut; and Scheinpflug, Gunter, to Triumph Werke Nurnberg A.G. Single keylever multiple action control for typewriters. 4,215,944, Cl. 400-314.000.

Goudie, Alexander C.: *See*—
Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., 4,216,232, Cl. 424-331.000.

Gould Inc.: *See*—
Panaro, Robert J., 4,216,457, Cl. 337-160.000.

Gould, Kenneth D.: *See*—
Morford, Gary W.; Jamieson, Guy; and Gould, Kenneth D., 4,215,475, Cl. 30-272.00R.

Gow-Mac Instrument Co.: *See*—
Lawson, Alexander E.; and Mathieu, Robert J., 4,215,564, Cl. 73-27.00R.

Gozzi, Fausto: *See*—
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, 4,216,157, Cl. 260-365.000.

Grace, James W., to Timex Corporation. Electronic vibratory feed bowl driver. 4,216,416, Cl. 318-128.000.

Grace, William H.: *See*—
Farrand, Clair L.; Foster, Vincent F.; and Grace, William H., 4,215,938, Cl. 356-358.000.

Gradowski, Stephen: *See*—
Hyner, Jacob; Hage, Jacob M.; and Gradowski, Stephen, 4,216,032, Cl. 148-6.15Z.

Graf, Walter: *See*—
Weidman, Erich; and Graf, Walter, 4,215,728, Cl. 139-370.200.

Graham, David E.: *See*—
Schneider, Louis; and Graham, David E., 4,216,152, Cl. 260-326.50S.

Graham, James T., to F. Jos. Lamb Company. Retarder for gravity conveyors. 4,215,772, Cl. 193-35.00A.

Graham, Jerome L.: *See*—
Tompkins, Richard M.; and Graham, Jerome L., 4,216,425, Cl. 324-443.000.

Graham, Kenneth: *See*—
Bayley, Barry J.; Brittain, Austin; Graham, Kenneth; and Thawley, Clive S., 4,215,928, Cl. 354-319.000.

Grant, Clyde P.; and Lowe, Richard M., to Scott Paper Company. Lithographic plate processing apparatus. 4,215,927, Cl. 354-317.000.

Grant, Frederic F.; and Martija, Henry M., to Bell & Howell Company. Transducer head vibration dampening. 4,216,505, Cl. 360-104.000.

Graphic Controls Corporation: *See*—
Bremer, Roger E.; and Falb, Richard D., 4,215,696, Cl. 128-641.000.

Graul, Juergen; and Mueller, Helmut, to Siemens Aktiengesellschaft. Process for the production of a semiconductor component with at least two zones which form a pn-junction and possess differing conductivity types. 4,216,030, Cl. 148-1.500.

Gravi-Mechanics Co.: *See*—
Dedolph, Richard R., 4,215,513, Cl. 47-56.000.

Grawinger, Otto: *See*—
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; and Schraven, Eckhard, 4,216,314, Cl. 544-123.000.

Great Lakes Carbon Corporation: *See*—
Goan, John C., 4,216,262, Cl. 428-367.000.

Grechishkin, Evgeny F.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.

Greco, Paul L., to O.K. Machine and Tool Corp. IC Extraction tool. 4,215,468, Cl. 29-764.000.

Greenberger, Joseph I., to Wean United, Inc. Roof assembly for an electrical arc furnace. 4,216,348, Cl. 13-32.000.

Greene, J. Jerrold; and Keller, Avrom. Method of laminating cloth with photographic emulsion. 4,216,286, Cl. 430-203.000.

Greenwood, Wade H.: *See*—
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,216,051, Cl. 156-499.000.

Gregory, John B.; Schwope, Arthur D.; and Wise, Donald L., to United States of America, Navy. PCL Fabric/film laminate. 4,215,686, Cl. 128-156.000.

Greten, Berndt: *See*—
Lamberts, Kurt; Leppin, Jurgen; Greten, Berndt; and Neubauer, Harry, 4,216,179, Cl. 264-25.000.

Griffin, Leonard H.; Hunt, Richard H.; and Telfer, Alexander, to Shell Oil Company. Neutron interface detector. 4,216,376, Cl. 250-357.000.

Griffing, Bruce F.; and Shivashankar, Srinivasarao A., to Purdue Research Foundation. Utilization of diodes as wide range responsive thermometers. 4,215,577, Cl. 73-362.0SC.

Griffith, Gary L.: *See*—
Brown, Vernon L.; Greenwood, Wade H.; and Griffith, Gary L., 4,216,051, Cl. 156-499.000.

Grimminger, Albert: *See*—
Seufert, Wilhelm; Gnadig, Gerhard; Przybylla, Fritz; Christen, Wolfgang; and Grimminger, Albert, 4,215,942, Cl. 366-343.000.

Grinnell Fire Protection Systems Company, Inc.: *See*—
Mears, James W., 4,215,751, Cl. 169-51.000.

Gronebaum, Theodor A., to Heinrich Kuper, Firma. Apparatus for assembling strips of veneer. 4,216,049, Cl. 156-433.000.

Gross, Glenn M., to Norlin Industries, Inc. Asynchronous tone generator. 4,215,616, Cl. 84-1.010.

Grosse, Joachim: *See*—
Gehrig, Wilfried W.; and Grosse, Joachim, 4,216,391, Cl. 307-265.000.

Groth, Rolf, to BFG Glassgroup. Heat reflecting pane and a method of producing it. 4,216,259, Cl. 428-216.000.

GTE Sylvania Incorporated: *See*—
Ramsay, John P., 4,215,980, Cl. 431-359.000.

Gulf Research & Development Company: *See*—
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., 4,216,341, Cl. 568-705.000.

Gullfiber AB: *See*—
Lundin, Tord R.; and Csiki, Kalman, 4,215,683, Cl. 128-152.000.

Gullota, Leonard, to La Voz Corporation. Musical instrument stand device. 4,215,838, Cl. 248-121.000.

Gupta, Maharaj K.: *See*—
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., 4,216,054, Cl. 162-57.000.

Gutekunst, Ferdinand; Lohse, Friedrich; and Schmid, Rolf, to Ciba-Geigy Corporation. Mixture containing a polyglycidyl ether and a dihydric phenol and the use thereof for the preparation of plastics. 4,216,304, Cl. 528-94.000.

Haar, Wilhelm: *See*—
Hartmann, Bernd; Haar, Wilhelm; Fischer, Wilfried; and Bauer, Roland, 4,216,275, Cl. 429-104.000.

Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, to Ciba-Geigy Corporation. Process for the preparation of novel benzopyrane derivatives. 4,216,155, Cl. 260-345.200.

Haase, Reinhold A.; Brockelsby, Norman D.; and Pike, Daniel W., to Dutton-Lainson Company. Winch. 4,215,850, Cl. 254-350.000.

Habich, Adolph B.; and Hunt, Ronald E., to International Business Machines Corporation. Paper feeding apparatus. 4,215,945, Cl. 400-636.000.

Hackert, Benjamin M., to Draka Plastics B.V. Manufacture of articles of polyvinyl chloride foil with sealed-in reinforcement material. 4,216,046, Cl. 156-252.000.

Haga, Takahiro: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; and Sakashita, Nobuyuki, 4,216,007, Cl. 71-094.000.

Hage, Jacob M.: *See*—
Hyner, Jacob; Hage, Jacob M.; and Gradowski, Stephen, 4,216,032, Cl. 148-6.15Z.

Hagedorn, Thomas H.; and DeForrest, Allen L., to Structural Instrumentation, Inc. Load measuring system for leaf spring suspensions. 4,215,754, Cl. 177-137.000.

Hagelberg, Allen C.; and Lobitz, Walter A., to General Dynamics Corporation Pomona Division. Anti-ship torpedo defense missile. 4,215,630, Cl. 102-10.000.

Hagen, Remon: *See*—
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,216,320, Cl. 544-345.000.

Hager, Aleksander; Zajaczkowski, Ryszard; and Adamowicz, Andrzej, to Kombinat Typowych Elementow Hydrauliki Silowej "Pszl-Hydral". Hydrostatic transmission control system. 4,215,546, Cl. 60-456.000.

Haggett, Roger E.: *See*—
Bakos, Peter; Haggett, Roger E.; and Poliak, Richard M., 4,216,035, Cl. 148-23.000.

Hakoyama, Akiyoshi, to Hitachi, Ltd. Method of driving a thermal head and apparatus therefor. 4,216,481, Cl. 346-76.0PH.

Hall, Richard B.: *See*—
Pond, Charles R.; and Hall, Richard B., 4,216,439, Cl. 331-94.50C.

Hallden, Donald F.; Peters, Clifford M.; and McCary, L. V., Jr., to W-K-M Wellhead Systems, Inc. Pressure responsive safety system for fluid lines. 4,215,746, Cl. 166-53.000.

Halle, Reidar; and Pastorino, Ronald L., to Argus Chemical Corporation. Unsaturated polyester resin foams and methods of preparation. 4,216,294, Cl. 521-99.000.

Halliburton Company: *See*—
Knox, Lloyd C., 4,215,951, Cl. 405-203.000.

Halna du Fretay, Gerard: *See*—
Bonnebat, Claude; and Halna du Fretay, Gerard, 4,216,253, Cl. 428-35.000.

Hamaekers, Arno: *See*—
Brenner, Heinz; and Hamaekers, Arno, 4,215,842, Cl. 248-562.000.

Hamaker, Ralph A.: *See*—
Castelli, Vittorio; Hamaker, Ralph A.; and Chai, Stephen T., 4,215,932, Cl. 355-16.000.

Hansford, Charles C.: *See*—
Spitz, Eugene B.; Brenz, Richard E.; and Hansford, Charles C., 4,215,695, Cl. 128-350.00V.

Hara, Akio: *See*—
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,009, Cl. 75-0.5AB.
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,034, Cl. 148-20.300.

Hara, Masahiro: *See*—
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,216,014, Cl. 75-128.00C.

Hara, Mitsunori: *See*—
Ikeda, Hironosuke; Hara, Mitsunori; Narukawa, Satoshi; and Maeda, Hiroji, 4,216,247, Cl. 427-115.000.

Harada, Shundo: *See*—
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, 4,216,240, Cl. 426-516.000.

Harata, Shoichi; Kobayashi, Hirotsugi; and Hibino, Sohei, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Signal switching system for actuating winking lights to be used for two-wheeled vehicles. 4,216,459, Cl. 340-134.000.

Hardegger, Emil, deceased: *See*—
Bamberg, Peter; Vegh, Ladislas J. S.; and Hardegger, Emil, deceased, 4,216,328, Cl. 546-329.000.

Hardegger, Olga, sole heir: *See*—
Bamberg, Peter; Vegh, Ladislas J. S.; and Hardegger, Emil, deceased, 4,216,328, Cl. 546-329.000.

Harford, Jack R., to RCA Corporation. Modular printed circuit board. 4,216,523, Cl. 361-393.000.

Harris, David A., to Owens-Corning Fiberglas Corporation. Acoustical wall baffle and method of making. 4,215,765, Cl. 181-287.000.

Hart, Fred W., Jr.: *See*—
Cushman, Robert H.; Hart, Fred W., Jr.; Kircher, David R.; and Ciavattoni, Anthony, 4,216,383, Cl. 250-439.00P.

Hartmann, Bernd; Haar, Wilhelm; Fischer, Wilfried; and Bauer, Roland, to Brown, Boveri & Cie AG. Electrochemical storage cell or battery. 4,216,275, Cl. 429-104.000.

Hartmann, Willy: *See*—
Heine, Hans-Georg; and Hartmann, Willy, 4,216,172, Cl. 568-364.000.

Hartness, Thomas S. Article retarding device for case loading machine. 4,215,521, Cl. 53-248.000.

Hasegawa, Mitsuo; Shinohara, Yoshinori; Suzuki, Takashi; and Yokota, Akira, to Nittan Company, Limited. Light scattering smoke detector. 4,216,377, Cl. 250-574.000.

Hasegawa, Shinichi; and Fujita, Hisanori, to Mitsubishi Monsanto Chemical Company. Method of manufacturing electroluminescent compound semiconductor wafer. 4,216,484, Cl. 357-17.000.

Hashimoto, Akira: *See*—
Kohama, Kazuo; Hashimoto, Akira; Nakamura, Junichi; and Tao, Kazuo, 4,215,988, Cl. 8-448.000.

Hashimoto, Kiyoshi: *See*—
Takayama, Seizo; and Hashimoto, Kiyoshi, 4,215,978, Cl. 425-190.000.

Hashimoto, Teiji: *See*—
Date, Nobuaki; Aizawa, Hiroshi; and Hashimoto, Teiji, 4,215,925, Cl. 354-234.000.

Haslam, Thomas: *See*—
Wilson, Michael T., 4,215,441, Cl. 3-15.000.

Hattori, Hiroyuki: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,215,588, Cl. 74-113.000.

Hattori, Yoshinori; and Matsuo, Yasushi, to NGK Spark Plug Co., Ltd. High strength silicon nitride sintered material. 4,216,021, Cl. 106-73.200.

Hatz, Ernst, to Motorenfabrik Hatz GmbH & Co. KG. Internal combustion engine with a sound-proofing shell. 4,215,664, Cl. 123-195.00C.

Healy, Dennis: *See*—
Tomlinson, Peter; and Healy, Dennis, 4,216,538, Cl. 367-89.000.

Heberlein Textildruck AG: *See*—
Steiger, Alfred, 4,215,991, Cl. 8-115.000.

Hedges, Walter P.: *See*—
Emerson, Paul J.; and Hedges, Walter P., 4,216,527, Cl. 364-483.000.

Heimann GmbH: *See*—
Kunze, Claus; and Dennhoven, Manfred, 4,216,499, Cl. 358-111.000.

Heine, Hans-Georg; and Hartmann, Willy, to Bayer Aktiengesellschaft. Preparation of cyclobutanones. 4,216,172, Cl. 568-364.000.

Heine, Helmut A.; and Erfurt, Werner E., to Propper Manufacturing Co., Inc.; and Heine Optotechnik GmbH & Co. KG. Endoscope. 4,215,678, Cl. 128-6.000.

Heine Optotechnik GmbH & Co. KG: *See*—
Heine, Helmut A.; and Erfurt, Werner E., 4,215,678, Cl. 128-6.000.

Heinrich Kuper, Firma: *See*—
Gronebaum, Theodor A., 4,216,049, Cl. 156-433.000.

Heinzer, Hans; and Muller, Werner, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for making, filling, closing and boxing bags. 4,215,520, Cl. 53-173.000.

Heitmann, Hans-Gunter, to Kraftwerk Union Aktiengesellschaft. Purifying plant for water to be vaporized in a steam generator of a nuclear reactor. 4,216,057, Cl. 176-37.000.

Henderson, William A., Jr., to American Cyanamid Company. Use of chiral rhodium-diphosphine catalyst capable of catalytic reduction of a tetramisole precursor to give a significant excess of the desired S-(−) isomer levamisole. 4,216,331, Cl. 548-320.000.

Henke, Arthur W.: *See*—
Antos, John M.; Henke, Arthur W.; Lindsay, Erin J.; and Embach, James T., 4,215,445, Cl. 4-323.000.

Henkel Corporation: *See*—
Rogier, Edgar R., 4,216,343, Cl. 568-853.000.
Rogier, Edgar R., 4,216,344, Cl. 568-853.000.

Henry, John; and Dadswell, John E., to British Hovercraft Corporation Limited. Attachment device for releasably connecting flexible skirt components to an air cushion vehicle. 4,215,757, Cl. 180-127.000.

Henze, Walter J.; and Purcell, William, to Penn Fishing Tackle Mfg. Co. Cable hardware. 4,215,505, Cl. 43-27.400.

Herbelleau, Yves, to Compagnie Generale des Etablissements Michelin. Radial tire with crown reinforcement block of two superimposed pairs of plies. 4,215,736, Cl. 152-361.00R.

Herdzina, Frank J.; and Urso, Patrick F., to American Can Company. Method for applying a decoration to a cylindrical body. 4,216,044, Cl. 156-215.000.

Herlan, Alton G., to Pivot Punch Corporation. Punch stripper. 4,215,608, Cl. 83-139.000.

Hermann, Lawrence F., to Kraft, Inc. Yogurt beverage and method for manufacture thereof. 4,216,243, Cl. 426-583.000.

Hermanson, Terry. Disposable umbrella of paperboard material or the like. 4,215,711, Cl. 135-19.500.
Hermesmeyer, Charles E.: *See—*
United States of America, National Aeronautics and Space Administration; and Hermesmeyer, Charles E., 4,216,542, Cl. 375-67.000.
Hernandez, Rafael J.: *See—*
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,215,648, Cl. 118-622.000.
Herring, Arthur J., Jr. Vibration absorption kit for vehicle seats. 4,215,841, Cl. 248-635.000.
Hertzenberg, Elliot P.: *See—*
Campbell, Thomas C.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,216,125, Cl. 252-527.000.
Herzog, William F.: *See—*
Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., 4,216,504, Cl. 358-8.000.
Hesch, Harold E.; Wold, Harold A.; and LeMaire, Leonard F., to Pullman Incorporated. Plug door actuating mechanism. 4,215,515, Cl. 49-218.000.
Hessler, Edward J.; and VanRheenen, Verlan H., to Upjohn Company, The. Synthesis of 16-unsaturated pregnanes from 17-keto steroids. 4,216,159, Cl. 260-397.100.
Hesston Corporation: *See—*
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,215,964, Cl. 414-111.000.
Hester, Thomas E., to Litton Systems, Inc. Inductive device with precision wound coil. 4,216,455, Cl. 336-160.000.
Hetherington, Robert D.; and Goelz, David W., to Poly-Glas Systems. Modular multiple-fluid component selection and delivery system. 4,215,721, Cl. 137-606.000.
Hewlett-Packard Company: *See—*
Mason, Martin K., 4,216,482, Cl. 346-129.000.
Heyer, Gunter; and Boddeker, Hans, to Bosch-Siemens Hausgerate GmbH. Circuit for controlling a dryer-program switching device. 4,215,486, Cl. 34-45.000.
Hibino, Sohei: *See—*
Harata, Shoichi; Kobayashi, Hirotsugi; and Hibino, Sohei, 4,216,459, Cl. 340-134.000.
Hickl, Anthony J.; and Rosof, Barry H., to Cabot Corporation. Wear-resistant iron-nickel-cobalt alloys. 4,216,015, Cl. 75-134.00F.
Hickson & Welch Limited: *See—*
Davidson, Hugh; Johnson, Keith T.; Leggeter, Brian E.; and Moore, Anthony J., 4,216,105, Cl. 252-174.190.
Thompson, John D., 4,216,111, Cl. 252-301.230.
Hildebrandt, William J.: *See—*
Rathbun, Richard H.; and Hildebrandt, William J., 4,215,828, Cl. 242-84.800.
Hile, James L.: *See—*
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,215,901, Cl. 299-22.000.
Hill, Amos G.: *See—*
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,215,964, Cl. 414-111.000.
Hill, James D.: *See—*
Buehner, William L.; and Hill, James D., 4,216,480, Cl. 346-75.000.
Hill, James E.; and Dahlstrom, Baesley I., to Dynetics Engineering Corp. Embossed character reader. 4,215,813, Cl. 235-448.000.
Hilliard, Lonnie G.; and Sibborn, Michael J., to Boeing Commercial Airplane Company. No-bleed curing of composites. 4,216,047, Cl. 156-285.000.
Himes, Glenn R.; and Zweig, Judith E., to Shell Oil Company. Smooth-look footwear composition. 4,216,131, Cl. 260-33.6AQ.
Himes, Glenn R.: *See—*
Zweig, Judith E.; and Himes, Glenn R., 4,216,132, Cl. 260-33.6AQ.
Hiner, Floyd C. Automatic hook setting apparatus. 4,215,503, Cl. 43-15.000.
Hines, David M.; and Waring, Charles D., to Fairfield Engineering Company, The. Coal sampling. 4,215,579, Cl. 73-424.000.
Hiraga, Shunsaku: *See—*
Murata, Hidemi; Fujishiro, Koretoshi; Hiraga, Shunsaku; and Hiyoshi, Masamitu, 4,216,060, Cl. 202-139.000.
Hirai, Koji: *See—*
Kikuga, Toyoji; and Hirai, Koji, 4,216,299, Cl. 525-491.000.
Kikuga, Toyoji; and Hirai, Koji, 4,216,300, Cl. 525-491.000.
Hirbod, Farrokh. Bumper-air bag. 4,215,878, Cl. 280-737.000.
Hird, David L.: *See—*
Langfield, Edward R.; Hile, James L.; and Hird, David L., 4,215,901, Cl. 299-22.000.
Hirmann, Georg; and Kagi, Bruno, to Multisafe AG. Alarm system for detecting changes in load on terrain. 4,216,469, Cl. 340-666.000.
Hirsch, Mordechai; and Cohen, Ilan, to Vargus Ltd. Hand held collet. 4,215,871, Cl. 279-48.000.
Hirschhorn, Joel S.: *See—*
Lawless, Gregory D.; Hirschhorn, Joel S.; and Andersen, Phillip J., 4,216,270, Cl. 428-567.000.
Hirschvogel, Alfred; and Freundlinger, Ernst, to Sigri Elektrographit Gesellschaft mit beschrankter Haftung. Flexible graphite sheet material treated with an alkali metal salt containing at least one of the elements chromium, molybdenum and tungsten. 4,216,266, Cl. 428-408.000.
Hitachi Chemical Company, Ltd.: *See—*
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, 4,216,246, Cl. 427-43.100.
Hitachi, Ltd.: *See—*
Hakoyama, Akiyoshi, 4,216,481, Cl. 346-76.0PH.
Ichiryu, Ken; Nakamura, Ichiro; and Matsuura, Katsumasa, 4,215,723, Cl. 137-625.630.
Jinbo, Yoshiji; Kozu, Eiji; and Narita, Hiroshi, 4,216,420, Cl. 318-370.000.
Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,216,487, Cl. 357-39.000.
Matsuda, Yasumasa; Shimada, Satoshi; Kawakami, Kanji; Nishihara, Motohisa; Kohzuma, Taisaku; Sagae, Syoji; Doi, Tetsuo; and Yamada, Takahiro, 4,216,477, Cl. 346-140.00R.
Shibata, Akira; and Watatani, Yoshizumi, 4,216,431, Cl. 455-333.000.
Tokuyama, Shunji; and Sugawara, Hiroyuki, 4,216,513, Cl. 361-13.000.
Hitachi Medical Corporation: *See—*
Kuroda, Masao; and Kanda, Hiroshi, 4,215,584, Cl. 73-626.000.
Hiyoshi, Masamitu: *See—*
Murata, Hidemi; Fujishiro, Koretoshi; Hiraga, Shunsaku; and Hiyoshi, Masamitu, 4,216,060, Cl. 202-139.000.
Hoarau, Roland J.: *See—*
Boulay, Jean-Louis; and Hoarau, Roland J., 4,216,519, Cl. 361-218.000.
Hoechst Aktiengesellschaft: *See—*
Emmel, Ludwig; Rochling, Hans; and Seyfarth, Gunther, 4,216,213, Cl. 424-219.000.
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,216,161, Cl. 260-456.00A.
Stein, Eckehard, 4,215,926, Cl. 354-300.000.
Sulzbach, Reinhard A., 4,216,265, Cl. 428-402.000.
Weber, Rolf-Ortwin; Anagnostopulos, Hiristo; and Gebert, Ulrich, 4,216,216, Cl. 424-251.000.
Hoffmann-La Roche Inc.: *See—*
Rosenberger, Michael, 4,216,312, Cl. 542-427.000.
Weigele, Manfred; and Keith, Dennis D., 4,216,008, Cl. 71-106.000.
Hoffmann, Rudiger; and Feichtiger, Dieter, to Daimler-Benz Aktiengesellschaft. Adjusting actuation operated by pressure medium. 4,215,625, Cl. 92-48.000.
Hoffmeister, Dirk: *See—*
Holzmann, Dieter; and Hoffmeister, Dirk, 4,215,615, Cl. 84-1.010.
Hofmann, Corris M.; Press, Jeffery B.; and Safir, Sidney R., to American Cyanamid Company. 4H-Thieno[3,4-b][1,4]benzodiazepines. 4,216,148, Cl. 260-243.300.
Hohmann, Klaus, to Metallgesellschaft Aktiengesellschaft. Process for thermally decomposing chlorides of bivalent or multivalent metals. 4,216,196, Cl. 423-481.000.
Hokkaido Soda Co., Ltd.: *See—*
Ikari, Yoshikatsu; Yokoyama, Shoichiro; Itaya, Ryutaro; and Ohkuma, Tsuneo, 4,216,084, Cl. 210-32.000.
Holcombe, Brooks H.; and Elwood, Homer E. Stove. 4,215,668, Cl. 126-60.000.
Holma, Johan E.; Andersson, Ake A.; and Gavlefors, Nils L., to Sandvik Aktiebolag. Cutting insert for chipforming machine. 4,215,957, Cl. 407-114.000.
Holmen, Hans K., to A/S Strommen Staal. System for active compensation of unwanted relative movements, preferably during loading of cargo. 4,215,851, Cl. 254-277.000.
Holmes, William K., to J. I. Case Company. Latching mechanism for spreader. 4,215,892, Cl. 294-815.00F.
Holmes, William K., to J. I. Case Company. Synchronized expandable spreader. 4,215,893, Cl. 294-81.0SF.
Holmstrom, James R., to Wean United, Inc. Tension bridle. 4,215,806, Cl. 226-195.000.
Holtermann, Heinz; and Luven, Arno, to Standard-Messo-Duisburg Gesellschaft fur Chemietechnik mit beschrankter Haftung & Co. Vacuum-electric arc heating system. 4,216,347, Cl. 13-9.00R.
Holzapfel, Georg; and Petel, Maurice, to Commissariat a l'Energie Atomique. Material for the construction of exoelectron detectors. 4,216,124, Cl. 252-518.000.
Holzmann, Dieter; and Hoffmeister, Dirk, to ITT Industries, Incorporated. Monolithic integrated selection circuit. 4,215,615, Cl. 84-1.010.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,215,902, Cl. 303-119.000.
Honeywell Inc.: *See—*
Geddes, John J., 4,216,486, Cl. 357-19.000.
Ishizuka, Mitsumasa; and Kawai, Makoto, 4,215,846, Cl. 251-298.000.
Hooker Chemicals & Plastics Corp.: *See—*
Jaszka, Daniel J.; and Partridge, Harold D., 4,216,195, Cl. 423-478.000.
Hoos, Pieter F. Plug valve with liner. 4,215,847, Cl. 251-317.000.
Hopkins, Dale W. Method and apparatus for purging disinfecting high purity water distribution systems. 4,216,185, Cl. 422-28.000.
Hopkinson, Peter R., to National Research Development Corporation. Induction charging electrostatic spraying device and method. 4,215,818, Cl. 239-3.000.
Horblin, Michel Y., to Societe Anonyme Automobiles Citroen; and Automobiles Peugeot. Speed restriction control device for vehicles, particularly motor vehicles. 4,216,520, Cl. 361-239.000.
Horie, Itsuo; and Wada, Yoshihiro, to Pentel Kabushiki Kaisha. Synthetic resin rod with a multiplicity of capillary passages. 4,215,948, Cl. 401-265.000.
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Low temperature steel alloy. 4,216,014, Cl. 75-128.00C.

Horiuchi, Yoshifumi: *See*—
Ikuta, Shigeru; Matsuura, Kazuo; and Horiuchi, Yoshifumi, 4,216,292, Cl. 435-191.000.
Horn, George L. Inverted cone aircraft. 4,215,832, Cl. 244-16.000.
Horn, William E. Dental film and method of forming the same. 4,216,200, Cl. 424-52.000.
Horowitz, Alvin E. Air plant support device. 4,215,514, Cl. 47-67.000.
Hosaka, Akio: *See*—
Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.
Hoskinson, Robert B.: *See*—
Williams, Robert A.; Cotton, William A.; and Hoskinson, Robert B., 4,215,831, Cl. 242-158.00F.
Hosoya, Nobukazu, to Sanyo Electric Co., Ltd. Chrominance signal processing circuit in color television receiver. 4,216,493, Cl. 358-28.000.
Hotta, Shigenori; Baba, Sadaaki; and Takahashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Current limiting apparatus. 4,216,456, Cl. 337-114.000.
Hotta, Tadahiko: *See*—
Nishizawa, Jun-ichi; Mochida, Yasunori; Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,216,038, Cl. 148-187.000.
Hoverlift Systems Ltd.: *See*—
Hunt, Rowland D., 4,215,756, Cl. 180-127.000.
Howell, Edward K., to General Electric Company. Portable ground fault protector. 4,216,516, Cl. 361-45.000.
Howerton, Anderson W., to Dayco Corporation. Self orienting power transmission belt. 4,215,589, Cl. 474-62.000.
Hruda, Robert M., to Westinghouse Electric Corp. Low voltage vacuum switch and operating mechanism. 4,216,359, Cl. 200-144.00B.
Hruda, Robert M.: *See*—
Cherry, Sidney J.; Hruda, Robert M.; and Wayland, Paul O., 4,216,360, Cl. 200-144.00B.
Hsu, Cheng H. Portable cooking unit without fuel supporting and ventilating plate. 4,215,667, Cl. 126-9.00R.
Hudson, Wilber G.; and Welch, Ronald B., to Lummus Industries, Inc. Apparatus for heat cutting sheet material. 4,215,607, Cl. 83-111.000.
Huelsman, Kenneth A.; and Deavenport, Joe E., to Hughes Aircraft Company. Programmable analog to digital converter. 4,216,465, Cl. 340-347.0AD.
Huggler, Peter E., to McGraw-Edison Company. Toaster chassis assembly. 4,216,372, Cl. 219-521.000.
Hughes Aircraft Company: *See*—
Huelsman, Kenneth A.; and Deavenport, Joe E., 4,216,465, Cl. 340-347.0AD.
Hughes, Richard S.: *See*—
Rahn, John P.; and Hughes, Richard S., 4,216,440, Cl. 331-94.50C.
Hugl, Erika: *See*—
Roos, Ernst; and Hugl, Erika, 4,216,158, Cl. 260-396.00N.
Huitema, Thomas W., to J. I. Case Company. Single lever control system. 4,215,771, Cl. 192-3.540.
Humphries, Richard L.; and Eide, Hans, to Kliklok Corporation. Article carrier with gusset retainers. 4,215,781, Cl. 206-434.000.
Hunt, Richard H.: *See*—
Griffin, Leonard H.; Hunt, Richard H.; and Telfer, Alexander, 4,216,376, Cl. 250-357.000.
Hunt, Ronald E.: *See*—
Habich, Adolph B.; and Hunt, Ronald E., 4,215,945, Cl. 400-636.000.
Hunt, Rowland D., to Hoverlift Systems Ltd. Apparatus for preventing damage to the flexible skirt of an air cushion vehicle, by ice. 4,215,756, Cl. 180-127.000.
Hunter, Alexander, to Transaction Management, Inc. Tape cartridge tensioning and ejecting mechanism. 4,216,508, Cl. 360-93.000.
Hunter, Walter D., to Texaco Development Corp. Secondary recovery process. 4,216,098, Cl. 252-8.55D.
Hurley, Frederick A., to Directed Energy Systems, Inc. System for monitoring and controlling electric power consumption. 4,216,384, Cl. 307-39.000.
Hurley, George L., III: *See*—
Krystek, Michael S.; Hurley, George L., III; Smith, Steven R.; and Rice, Stephen E., 4,216,529, Cl. 364-510.000.
Hurley, John F., to Avco Corporation. Apparatus for and method of suppressing infrared radiation emitted from gas turbine engine. 4,215,537, Cl. 60-264.000.
Huschens, Rolf: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.
Huschle, Robert J.; and Roberts, Sidney J., to Sheldahl, Inc. Unidirectional tape. 4,215,516, Cl. 51-399.000.
Hutson, Jearld L. Lateral semiconductor diac. 4,216,488, Cl. 357-39.000.
Hydro-Plan Engineering Ltd.: *See*—
Mehoudar, Raphael, 4,215,822, Cl. 239-542.000.
Hydromagnetics, Inc.: *See*—
Shalhoob, William N.; Chenchick, Carl W.; and Kaspaul, Alfred F., 4,216,092, Cl. 210-222.000.
Hylsa, S.A.: *See*—
Martinez Vera, Enrique R.; and Becerra Novoa, Jorge O., 4,216,011, Cl. 75-91.000.
Hyner, Jacob; Hage, Jacob M.; and Gradowski, Stephen. Oil composition and method for treating phosphated metal surfaces. 4,216,032, Cl. 148-6.15Z.
Hyzak, Daniel L.: *See*—
Baker, Don R.; and Hyzak, Daniel L., 4,216,238, Cl. 426-321.000.
IBAG-Vertrieb GmbH: *See*—
Schafer, Arnold, 4,215,826, Cl. 241-207.000.
Ibel, Manfred. Trouser construction. 4,215,685, Cl. 128-159.000.
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimada, Katsumi, to Nippon Telegraph and Telephone Public Corporation; and Takeda Riken Kogyo Kabushikikaisha. Pattern generator. 4,216,533, Cl. 365-230.000.
Ichiryu, Ken; Nakamura, Ichiro; and Matsuura, Katsumasa, to Hitachi, Ltd. Fluid pressure servo valve assembly. 4,215,723, Cl. 137-625.630.
Ideal Industries, Inc.: *See*—
Wells, Royzell F., 4,215,598, Cl. 81-9.50A.
Igarashi, Hideaki: *See*—
Kono, Migaki; Igarashi, Hideaki; and Kishimoto, Kenjiro, 4,216,280, Cl. 429-247.000.
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, to Abbott Laboratories. Fortimicin factors D and KE compounds. 4,216,308, Cl. 536-17.00R.
Iizawa, Osamu: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,102, Cl. 252-63.200.
Ikari, Yoshikatsu; Yokoyama, Shoichiro; Itaya, Ryutaro; and Ohkuma, Tsuneo, to Agency of Industrial Science & Technology; and Hokkaido Soda Co., Ltd. Method for treating waste water containing organic contaminants utilizing a magnesia adsorbent. 4,216,084, Cl. 210-32.000.
Ikeda, Hironosuke; Hara, Mitsunori; Narukawa, Satoshi; and Maeda, Hiroji, to Sanyo Electric Co., Ltd. Method of manufacturing positive electrode for nonaqueous cell. 4,216,247, Cl. 427-115.000.
Ikuta, Shigeru; Matsuura, Kazuo; and Horiuchi, Yoshifumi, to Toyo Jozo Kabushiki Kaisha. Process for the production of sarcosine oxidase. 4,216,292, Cl. 435-191.000.
Imai, Hirosuke: *See*—
Yuasa, Hitoshi; and Imai, Hirosuke, 4,216,307, Cl. 528-422.000.
Imazeki, Kazuyoshi; and Kazami, Koichi, to General Research of Electronics, Inc. Automatic switching system for a combination transceiver-auxilliary receiver radio. 4,216,432, Cl. 455-79.000.
Immer, Hans U.: *See*—
Bellini, Francesco; and Immer, Hans U., 4,216,209, Cl. 424-177.000.
Immink, Kornelis A.: *See*—
van Dam, Rudolf A. A. F.; and Immink, Kornelis A., 4,216,419, Cl. 318-327.000.
Imperial Chemical Industries Limited: *See*—
Baker, Alan S., 4,216,114, Cl. 252-341.000.
Thomas, Berwyn C., 4,216,184, Cl. 264-229.000.
Inada, Hiroshi: *See*—
Shimonou, Shigeru; and Inada, Hiroshi, 4,216,415, Cl. 318-600.000.
Independent Broadcasting Authority: *See*—
Baldwin, John L. E.; Bellis, Robert A.; and Ive, John G. S., 4,216,460, Cl. 371-57.000.
Lothian, John S.; and Windram, Michael D., 4,216,496, Cl. 358-83.000.
Indian Head Inc.: *See*—
Moran, Thomas F., Jr.; and Volgyesy, Ivan L., 4,215,787, Cl. 220-3.600.
Industria Politecnica Meridionale S.p.A.: *See*—
De Feo, Carlo, 4,216,453, Cl. 335-133.000.
Inoue, Haruo: *See*—
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, 4,216,287, Cl. 430-271.000.
Inoue, Hideaki: *See*—
Takeuchi, Hiroshi; Inoue, Hideaki; Kawabata, Hidetsugu; and Ishiwatari, Keizo, 4,216,271, Cl. 428-607.000.
Inoue, Shigeo; Kimura, Yoshiharu; and Kinta, Manzo, to Kao Soap Co., Ltd. Process for producing a glycolipid methyl ester. 4,216,311, Cl. 536-115.000.
Inouye, Shigeharu: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Institut Francais du Petrole: *See*—
Delignieres, Robert, 4,216,537, Cl. 367-88.000.
Institut National de la Recherche Agronomique: *See*—
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,215,672, Cl. 126-419.000.
Intel Corporation: *See*—
Clover, Richmond B.; and Miller, George J., 4,216,541, Cl. 371-38.000.
Intel Magnetics Inc.: *See*—
Clover, Richmond B.; and Miller, George J., 4,216,541, Cl. 371-38.000.
International Business Machines Corporation: *See*—
Bakos, Peter; Haggett, Roger E.; and Poliak, Richard M., 4,216,035, Cl. 148-23.000.
Buehner, William L.; and Hill, James D., 4,216,480, Cl. 346-75.000.
Esteban, Daniel J.; Galand, Claude R.; Mauduit, Daniel; and Menez, Jean, 4,216,354, Cl. 179-15.55R.
Giedd, Gary R.; Karsch, Arthur F.; and Lindauer, Sydney L., 4,216,478, Cl. 346-61.000.

Habich, Adolph B.; and Hunt, Ronald E., 4,215,945, Cl. 400-636.000.
International Flavors & Fragrances Inc.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.
International Housing Limited: *See*—
Koch, Kenneth K., 4,215,519, Cl. 52-741.000.
International Telephone and Telegraph Corporation: *See*—
Albanese, Damian F., 4,216,472, Cl. 343-7.300.
Borsuk, Leslie M., 4,215,937, Cl. 356-73.100.
Ghahramani, Iraj, 4,215,566, Cl. 73-32.00A.
LeGrand, Jesse S., 4,216,433, Cl. 328-111.000.
Levine, Arnold M., 4,216,474, Cl. 343-17.2PC.
Inuzuka, Tsuneki: *See*—
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,215,588, Cl. 74-113.000.
Ionics Inc.: *See*—
Goldstein, Arthur L., 4,216,073, Cl. 204-296.000.
Iowa Beef Processors, Inc.: *See*—
Chittenden, Jimmie A., 4,216,085, Cl. 210-44.000.
Ippisch, Friedrich: *See*—
Scheurecker, Werner; and Ippisch, Friedrich, 4,215,740, Cl. 164-446.000.
IRECO Chemicals: *See*—
Sudweeks, Walter B.; and Jessop, Harvey A., 4,216,040, Cl. 149-21.000.
Ireland, M. Sue: *See*—
Larson, Thomas M.; Moring, Thomas B.; and Ireland, M. Sue, 4,215,706, Cl. 131-143.000.
Irick, Gether, Jr.: *See*—
Wang, Richard H. S.; and Irick, Gether, Jr., 4,216,137, Cl. 260-42.460.
Irie, Tadashi: *See*—
Tanida, Hiroshi; and Irie, Tadashi, 4,216,231, Cl. 424-330.000.
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and by Kudryavtseva, Galina A., administrator. Laser therapy apparatus. 4,215,694, Cl. 128-303.100.
Ishida, Hiroaki: *See*—
Kitai, Kiyoshi; and Ishida, Hiroaki, 4,215,923, Cl. 354-30.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Nishiyama, Ryuzo; Haga, Takahiro; and Sakashita, Nobuyuki, 4,216,007, Cl. 71-094.000.
Ishii, Shinzo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.
Ishikawa, Shigeaki: *See*—
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Ishiwatari, Keizo: *See*—
Takeuchi, Hiroshi; Inoue, Hideaki; Kawabata, Hidetsugu; and Ishiwatari, Keizo, 4,216,271, Cl. 428-607.000.
Ishizuka, Mitsumasa; and Kawai, Makoto, to Honeywell Inc. Multiportion unitary valve seat and valve incorporating it. 4,215,846, Cl. 251-298.000.
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., to E-Systems, Inc. Apparatus for monitoring a multichannel receiver. 4,216,497, Cl. 358-84.000.
Itaya, Ryutaro: *See*—
Ikari, Yoshikatsu; Yokoyama, Shoichiro; Itaya, Ryutaro; and Ohkuma, Tsuneo, 4,216,084, Cl. 210-32.000.
Itey-Bernard, Georges, to Regie Nationale des Usines Renault. Lift truck. 4,215,971, Cl. 414-696.000.
Ito, Hiroyuki: *See*—
Iwasaki, Norio; Satoh, Toshio; Ito, Hiroyuki; and Koike, Ikuya, 4,216,357, Cl. 179-100.10R.
ITT Industries, Incorporated: *See*—
Gehrig, Wilfried W.; and Grosse, Joachim, 4,216,391, Cl. 307-265.000.
Holzmann, Dieter; and Hoffmeister, Dirk, 4,215,615, Cl. 84-1.010.
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zorislav N. Process for producing mineral fillers with graft peroxy groups for polymers. 4,216,024, Cl. 106-308.00Q.
Ive, John G. S.: *See*—
Baldwin, John L. E.; Bellis, Robert A.; and Ive, John G. S., 4,216,460, Cl. 371-57.000.
Iwasaki, Norio; Satoh, Toshio; Ito, Hiroyuki; and Koike, Ikuya, to Fuji Telecasting Co., Ltd. Optical play-back system for recorded signals with oscillating beam. 4,216,357, Cl. 179-100.10R.
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, to Hitachi Chemical Company, Ltd. Method of improving adhesion between insulating substrates and metal deposits electrolesaly plated thereon, and method of making additive printed circuit boards. 4,216,246, Cl. 427-43.100.
Iwer, Herbert W., to Motorola, Inc. Quarter wave microstrip directional coupler having improved directivity. 4,216,446, Cl. 333-112.000.
J. I. Case Company: *See*—
Holmes, William K., 4,215,892, Cl. 294-815.00F.
Holmes, William K., 4,215,893, Cl. 294-81.0SF.
Huitema, Thomas W., 4,215,771, Cl. 192-3.540.
Schoelkopf, James E., 4,215,874, Cl. 280-474.000.
J. M. Voith GmbH: *See*—
Bosch, Toivo, 4,215,882, Cl. 285-227.000.
Nykopp, Erik A., 4,216,056, Cl. 162-300.000.
Jacks, Donald E. Trailer hitch. 4,215,876, Cl. 280-483.000.
Jackson, Robert. Boat hull anti-fouling shroud. 4,215,644, Cl. 114-222.000.
Jacob, Ezekiel J.: *See*—
Cooper, Sidney; and Jacob, Ezekiel J., 4,216,283, Cl. 430-126.000.
Jaeggi, Knut A.: *See*—
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,216,155, Cl. 260-345.200.
Jagers, Leopold, to Trennjager Maschinenfabrik, Inh. Leopold Jagers. Drilling machine. 4,215,958, Cl. 408-38.000.
Jaggars, Jamy L.: *See*—
Shaffstall, Robert M.; Burton, Russell R.; and Jaggars, Jamy L., 4,215,712, Cl. 137-39.000.
James Hardie & Coy. Pty. Limited: *See*—
Gazzard, Warwick H.; and Kearin, Roger M., 4,216,043, Cl. 156-193.000.
James, Kenneth A.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,215,576, Cl. 73-356.000.
James Neill Holdings Limited: *See*—
Fisher, John H.; Bradbrook, John D.; and Bassett, Peter J., 4,215,480, Cl. 33-125.00C.
Jamieson, Guy: *See*—
Morford, Gary W.; Jamieson, Guy; and Gould, Kenneth D., 4,215,475, Cl. 30-272.00R.
Jan, Gerald; Hagen, Remon; and Lenoir, John, to Ciba-Geigy AG. Quinoxaline bleach catalysts. 4,216,320, Cl. 544-345.000.
Janssen, Alexander P. Cooking utensils. 4,215,629, Cl. 99-403.000.
Janssen Pharmaceutica N.V.: *See*—
Van der Aa, Marcel; and Stokbroekx, Raymond, 4,216,217, Cl. 424-263.000.
Japan Aircraft Mfg. Co., Ltd.: *See*—
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Jarowenko, Wadym: *See*—
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,216,310, Cl. 536-109.000.
Jaszka, Daniel J.; and Partridge, Harold D., to Hooker Chemicals & Plastics Corp. Production of chlorine dioxide having low chlorine content. 4,216,195, Cl. 423-478.000.
Jautelat, Manfred: *See*—
Arlt, Dieter; and Jautelat, Manfred, 4,216,162, Cl. 260-500.50H.
Jeantet, Henri: *See*—
Callet, Robert; and Jeantet, Henri, 4,215,725, Cl. 137-855.000.
Jefferies, Robert K.; and Egbert, Gary L., to NL Industries, Inc. Quick release bollard. 4,215,643, Cl. 114-218.000.
Jernberg, Nils: *See*—
Kavanau, Julian L.; and Jernberg, Nils, 4,215,479, Cl. 33-27.00K.
Jessop, Harvey A.: *See*—
Sudweeks, Walter B.; and Jessop, Harvey A., 4,216,040, Cl. 149-21.000.
Jetten, Arnold G. M.: *See*—
Goettsch, Reijer; and Jetten, Arnold G. M., 4,216,151, Cl. 260-326.5FN.
Jinbo, Yoshiji; Kozu, Eiji; and Narita, Hiroshi, to Hitachi, Ltd. Braking control system selectively operable in dynamic and regenerative braking operation for electric car. 4,216,420, Cl. 318-370.000.
Jingu, Masaharu: *See*—
Kunii, Yutaka; Shimoji, Toshikuni; and Jingu, Masaharu, 4,215,585, Cl. 73-633.000.
John Fluke Mfg. Co., Inc.: *See*—
Lam, Tim Y.; and Saper, Barry M., 4,216,374, Cl. 371-27.000.
Johns-Manville Corporation: *See*—
Wernsing, David G., 4,216,296, Cl. 521-175.000.
Johns-Nigrelli-Johns: *See*—
Nigrelli, Biagio J., 4,215,525, Cl. 53-580.000.
Johnson, Calvin K.; and Craig, Robert S., to Acme Resin Corporation. Shell process foundry resin compositions. 4,216,133, Cl. 260-38.000.
Johnson Controls, Inc.: *See*—
Divjak, August A.; and Miczek, Peter, 4,216,422, Cl. 318-612.000.
Johnson & Johnson: *See*—
Levesque, Yvon G., 4,215,692, Cl. 128-287.000.
Johnson, Keith T.: *See*—
Davidson, Hugh; Johnson, Keith T.; Leggeter, Brian E.; and Moore, Anthony J., 4,216,105, Cl. 252-174.190.
Johnson, Leighton C., to Miles Laboratories, Inc. Method of making printed reagent test devices. 4,216,245, Cl. 427-2.000.
Johnson, Michael E.: *See*—
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,216,497, Cl. 358-84.000.
Johnson, Ralph E., to Singer Company, The. Needle bar suspension means for a zig-zag sewing machine. 4,215,638, Cl. 112-221.000.
Johnson, Ralph E., to Singer Company, The. Selectively controllable bobbin thread pull-off mechanism. 4,215,639, Cl. 112-242.000.
Johnson, Raymond A., to U.M.C. Industries, Inc. Coin-handling device. 4,215,773, Cl. 194-9.00R.
Johnson, Richard N., to United States of America, Army. Digital beam former. 4,216,475, Cl. 343-100.0SA.
Johnson, Roy A., to Upjohn Company, The. 5-Keto prostaglandins. 4,216,336, Cl. 560-53.000.

Johnston, Michael D., to Burroughs Wellcome Co. Process for producing interferon. 4,216,203, Cl. 424-85.000.
Johnston, Robert A.; and Keesee, Wallace G., to General Electric Company. Radio frequency shield structure. 4,215,796, Cl. 220-306.000.
Jones, Daniel G., to Mobil Oil Corporation. Imidazoline salts of acid phosphonates. 4,216,334, Cl. 548-352.000.
Jones, David F.: *See*—
Burke, Edmund T.; and Jones, David F., 4,216,356, Cl. 179-99.0LS.
Jones, Derek, to A. C. Sprayers Inc. Spraying apparatus employing a skirt structure. 4,215,758, Cl. 180-128.000.
Jones, Howard: *See*—
Dorn, Conrad P.; and Jones, Howard, 4,216,160, Cl. 260-455.00R.
Jones, John W. Environmentally assisted heating and cooling system. 4,215,551, Cl. 60-643.000.
Jones, Robert L.: *See*—
Botsco, Ronald J.; Todd, John E.; and Jones, Robert L., 4,215,583, Cl. 73-582.000.
Jones, Robert P., to F. Jos. Lamb Company. Brake drum turning machine. 4,215,603, Cl. 82-1.300.
Jonsson, Gunther: *See*—
Bjorkman, Karl A. G.; and Jonsson, Gunther, 4,216,406, Cl. 313-315.000.
Jourdan, Paul: *See*—
Chiapale, Jean-Pierre J.; Damagnez, Jacques A.; Denis, Pierre M.; and Jourdan, Paul, 4,215,672, Cl. 126-419.000.
Judd, Edward A.: *See*—
Mackal, Glenn H.; and Judd, Edward A., 4,216,182, Cl. 264-71.000.
Juferov, Anatoly M.; Shakhova, Galina I.; and Nesterova, Olga M. Method of treating phenolic waters formed in the manufacture of phenol-formaldehyde resins. 4,216,088, Cl. 210-59.000.
Just, Friedrich E.: *See*—
Cox, Fern H.; Taylor, William M.; and Just, Friedrich E., 4,215,747, Cl. 166-85.000.
Kabel-und Metallwerke Gutehoffnungshuette AG: *See*—
Kuypers, Hubert, 4,215,559, Cl. 72-77.000.
Kabushiki Kaisha Daini Seikosha: *See*—
Ohki, Toshimi, 4,216,029, Cl. 148-1.500.
Ohki, Toshimi, 4,216,490, Cl. 357-43.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Kamikawa, Nobuo, 4,215,618, Cl. 84-1.240.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Harata, Shoichi; Kobayashi, Hirotsugi; and Hibino, Sohei, 4,216,459, Cl. 340-134.000.
Kabushikikaisha Anoa: *See*—
Shimizu, Takeshi, 4,215,866, Cl. 273-275.000.
Kach, Alfred, to BBC Brown Boveri & Company Limited. Waveguide for the transmission of electromagnetic energy. 4,216,449, Cl. 333-236.000.
Kadija, Igor V., to Olin Corporation. Diaphragms for use in the electrolysis of alkali metal chlorides. 4,216,072, Cl. 204-252.000.
Kagi, Bruno: *See*—
Hirmann, Georg; and Kagi, Bruno, 4,216,469, Cl. 340-666.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Rigge, Ronald J.; Beadle, Burton J.; and Belding, William A., 4,216,130, Cl. 260-29.70R.
Kakishima, Todomu: *See*—
Ohtani, Yoshio; and Kakishima, Todomu, 4,216,454, Cl. 335-262.000.
Kali-Chemie Aktiengesellschaft: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.
Kamikawa, Nobuo, to Kabushiki Kaisha Kawai Gakki Seisakusho. Apparatus for presetting musical tone effects in electronic musical instrument. 4,215,618, Cl. 84-1.240.
Kamm, Willibald: *See*—
Fritz, Ulrich; Kamm, Willibald; Kipp, Thorwald; and Sudmersen, Udo, 4,215,825, Cl. 241-34.000.
Kanda, Hiroshi: *See*—
Kuroda, Masao; and Kanda, Hiroshi, 4,215,584, Cl. 73-626.000.
Kane, Alfred J., deceased; and by Kane, Helen, executrix. Fabricated disc filter core with pipe having a maximized internal cross-sectional area. 4,216,093, Cl. 210-247.000.
Kane, Dalsimer, et al: *See*—
Lynch, Ronald; and Purcell, John H., 4,216,400, Cl. 310-154.000.
Kane, Helen, executrix: *See*—
Kane, Alfred J., deceased; and Kane, Helen, executrix, 4,216,093, Cl. 210-247.000.
Kane, Jack: *See*—
Beecham, David; and Kane, Jack, 4,216,395, Cl. 307-350.000.
Kanebo, Ltd.: *See*—
Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, 4,216,264, Cl. 428-397.000.
Kano, Ichiro: *See*—
Karasawa, Tamotsu; Kano, Ichiro; and Yoshinari, Hideki, 4,215,934, Cl. 355-51.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Watanabe, Noritoshi; Yamamoto, Riyozo; Shoji, Isao; and Yagi, Hisanori, 4,216,055, Cl. 162-117.000.
Kao Soap Co., Ltd.: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Kinta, Manzo, 4,216,311, Cl. 536-115.000.
Sato, Toshio; and Nagao, Shigeru, 4,215,992, Cl. 8-445.000.
Kao, Ti. Helmet-mask for cold weather and/or particulate laden environments. 4,215,437, Cl. 2-424.000.
Karasawa, Tamotsu; Kano, Ichiro; and Yoshinari, Hideki, to Canon Kabushiki Kaisha. Printing apparatus. 4,215,934, Cl. 355-51.000.
Karsch, Arthur F.: *See*—
Giedd, Gary R.; Karsch, Arthur F.; and Lindauer, Sydney L., 4,216,478, Cl. 346-61.000.
Karwowski, Wieslaw A., to E M I Limited. Organization of tomographic data for a two dimensional display. 4,216,526, Cl. 364-414.000.
Kaspaul, Alfred F.: *See*—
Shalhoob, William N.; Chenchick, Carl W.; and Kaspaul, Alfred F., 4,216,092, Cl. 210-222.000.
Kasper, Robin: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.
Kasprzak, Vincent D.: *See*—
Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., 4,216,504, Cl. 358-8.000.
Kasuga, Muneo: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,215,931, Cl. 355-14.00R.
Kasuga, Osamu; Omi, Satoru; and Kyuzaki, Tsutomu, to Nippon Electric Co., Ltd. Microwave distributed-constant band-pass filter comprising projections adjacent on capacitively coupled resonator rods to open ends thereof. 4,216,448, Cl. 333-203.000.
Kato, Shigeru: *See*—
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Katoda, Takashi; and Kishi, Masato, to Katoda, Takashi. Method for manufacturing a heterojunction semiconductor device by disappearing intermediate layer. 4,216,037, Cl. 148-175.000.
Kaufman, Kurt D., to Thomas C. Elder, Inc. Process for making α-loweralkylfurocoumarins. 4,216,154, Cl. 260-343.210.
Kaufmann, Harold. Flood warning device. 4,216,468, Cl. 340-620.000.
Kavanau, Julian L.; and Jernberg, Nils. Cam driven curve tracking apparatus. 4,215,479, Cl. 33-27.00K.
Kawabata, Hidetsugu: *See*—
Takeuchi, Hiroshi; Inoue, Hideaki; Kawabata, Hidetsugu; and Ishiwatari, Keizo, 4,216,271, Cl. 428-607.000.
Kawada, Tousuke: *See*—
Asai, Koichi; and Kawada, Tousuke, 4,215,469, Cl. 29-835.000.
Kawai, Makoto: *See*—
Ishizuka, Mitsumasa; and Kawai, Makoto, 4,215,846, Cl. 251-298.000.
Kawai, Masayoshi: *See*—
Sakai, Tadao; Kawai, Masayoshi; and Shishido, Tadao, 4,216,284, Cl. 430-140.000.
Kawakami, Kanji: *See*—
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Kawakami, Katsuo: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Kawamura, Kiyoshi: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,216,014, Cl. 75-128.00C.
Uozumi, Yukio; and Mizoshita, Fumitaka, 4,215,837, Cl. 246-433.000.
Kawata, Shoji: *See*—
Sakakibara, Naoji; and Kawata, Shoji, 4,215,760, Cl. 180-176.000.
Kay, Edward L., to Firestone Tire & Rubber Company, The. Accelerated rubber composition. 4,216,126, Cl. 260-5.000.
Kazami, Koichi: *See*—
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,216,432, Cl. 455-79.000.
Kazuno, Yuzo: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Keane, William J.; and Mezak, John A., to Eaton Corporation. High performance ferromagnetic filters applicable from the VHF through the microwave frequency ranges. 4,216,447, Cl. 333-207.000.
Kearin, Roger M.: *See*—
Gazzard, Warwick H.; and Kearin, Roger M., 4,216,043, Cl. 156-193.000.
Keasler, Sydney J.: *See*—
Cantrell, Steven M.; and Keasler, Sydney J., 4,215,974, Cl. 417-34.000.
Keesee, Wallace G.: *See*—
Johnston, Robert A.; and Keesee, Wallace G., 4,215,796, Cl. 220-306.000.
Keith, Dennis D.: *See*—
Weigele, Manfred; and Keith, Dennis D., 4,216,008, Cl. 71-106.000.
Keller, Avrom: *See*—
Greene, J. Jerrold; and Keller, Avrom, 4,216,286, Cl. 430-203.000.
Keller-Juslen, Camilla; and King, Hamilton D., to Sandoz Ltd. Antibiotics S 53210/A-I, S 53210/A-II and S 53210/A-III. 4,216,206, Cl. 424-117.000.

Kelley, Thomas G. Hair shears. 4,215,474, Cl. 30-233.000.

Kelly, Calvin E.; and Stanley, Richard W., to United States Steel Corporation. Sealing means for a coke oven chuck door. 4,216,062, Cl. 202-248.000.

Kempchen & Co. GmbH: *See*—
Tuckmantel, Hans-Joachim, 4,215,745, Cl. 165-160.000.

Kendall Company, The: *See*—
Patel, Bhupendra C., 4,215,699, Cl. 128-748.000.

Kerch, Ronald C., to Multi-Fuel Energy Systems, Inc. Hot air furnace. 4,215,669, Cl. 126-99.00R.

Kerscher, Clarence J. Bird feeder. 4,215,652, Cl. 119-51.00R.

Kesselman, David A. Torque limiter for use with off-the-shelf fastening elements. 4,215,600, Cl. 81-52.40R.

Ketterer, Jack L. Headwear mounted transparent film distributing means. 4,215,436, Cl. 2-422.000.

Khantimirov, Sergei S.: *See*—
Popov, Alexandr D.; Solomin, Vladimir A.; Khantimirov, Sergei S.; and Shirikov, Alexandr A., 4,216,397, Cl. 310-13.000.

Khartli, Inc.: *See*—
Batchelder, Clarence F.; and Casady, Kent B., 4,215,599, Cl. 81-52.40R.

Kharzhevsky, Rostislav A.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.

Khlyvnjuk, Boris G.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.

Kibby, Robert M., to Reynolds Metals Company. Aluminum purification system. 4,216,010, Cl. 75-68.00A.

Kifor, Harry T., to Goodyear Tire & Rubber Company, The. Method of removing hose from a mandrel and a mandrel adapted to the method. 4,215,459, Cl. 29-426.100.

Kikuchi, Nobuaki: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,102, Cl. 252-63.200.

Kikuchi, Takahiko: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.

Kikuga, Toyoji; and Hirai, Koji, to Sumitomo Durez Company, Ltd. Color developer for pressure-sensitive copying paper. 4,216,299, Cl. 525-491.000.

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Kim, Kyong-Min: *See*—
United States of America, National Aeronautics and Space Administration; Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E., 4,216,186, Cl. 422-246.000.

Kimura, Yoshiharu: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Kinta, Manzo, 4,216,311, Cl. 536-115.000.

King, Hamilton D.: *See*—
Keller-Juslen, Camilla; and King, Hamilton D., 4,216,206, Cl. 424-117.000.

Kinstle, George P., to Ferro Corporation. Zinc sulfide based pigments containing selenium. 4,216,023, Cl. 106-293.000.

Kinta, Manzo: *See*—
Inoue, Shigeo; Kimura, Yoshiharu; and Kinta, Manzo, 4,216,311, Cl. 536-115.000.

Kipp, Thorwald: *See*—
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Kircher, David R.: *See*—
Cushman, Robert H.; Hart, Fred W., Jr.; Kircher, David R.; and Ciavattoni, Anthony, 4,216,383, Cl. 250-439.00P.

Kirchhof, Gunther: *See*—
Feneberg, Paul; Konigl, Georg; Kirchhof, Gunther; and Schatz, Anton, 4,215,933, Cl. 355-50.000.

Kirsch, Reinhard: *See*—
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,216,161, Cl. 260-456.00A.

Kishi, Masato: *See*—
Katoda, Takashi; and Kishi, Masato, 4,216,037, Cl. 148-175.000.

Kishimoto, Kenjiro: *See*—
Kono, Migaki; Igarashi, Hideaki; and Kishimoto, Kenjiro, 4,216,280, Cl. 429-247.000.

Kishino, Takao; Yamaguchi, Nobuo; and Mera, Yoichi, to Futaba Denshi Kogyo K. K. Luminescent display device having conductors for field control. 4,216,470, Cl. 340-753.000.

Kisovec, Adrian V., to Boeing Company, The. Folding mechanism. 4,215,587, Cl. 74-22.00R.

Kitai, Kiyoshi; and Ishida, Hiroaki, to Seiko Koki Kabushiki Kaisha. Programmed shutter. 4,215,923, Cl. 354-30.000.

Kitzing, Rainer; Whitear, Brian R. D.; Long, William E.; Reeves, David L. R.; and Wood, Glenn P., to Ciba-Geigy AG. Azo(hydrazo)-anthraquinone compounds. 4,216,146, Cl. 260-202.000.

Kiwala, Jacob: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.

Klauke, Erich: *See*—
Kysela, Ernst; Lantzsch, Reinhard; and Klauke, Erich, 4,216,173, Cl. 260-654.00R.

Klein, Gerald B. Push-down gate in a raised aperture in a can end. 4,215,792, Cl. 220-268.000.

Klemann, Lawrence P.; and Stogryn, Eugene L., to Exxon Research & Engineering Co. Method of preparing inorganic-alkali metal salts. 4,216,191, Cl. 423-364.000.

Klemann, Lawrence P.: *See*—
Rao, Bhaskara M. L.; and Klemann, Lawrence P., 4,216,192, Cl. 423-366.000.

Klenk, Adam; and Klenk, Helmut. One-way conduit closure. 4,215,716, Cl. 137-527.400.

Klenk, Helmut: *See*—
Klenk, Adam; and Klenk, Helmut, 4,215,716, Cl. 137-527.400.

Kliklok Corporation: *See*—
Humphries, Richard L.; and Eide, Hans, 4,215,781, Cl. 206-434.000.

Kline, Richard H., to Goodyear Tire & Rubber Company, The. Phenolic/ester antioxidant system. 4,216,116, Cl. 252-404.000.

Klioze, Solomon S.; and Ehrgott, Frederick J., to American Hoechst Corporation. Antidepressant and analgesic 4-aryloxy- and 4-arylthio-3-phenylpiperidines. 4,216,218, Cl. 424-267.000.

Klun, Jerome A.; Plimmer, Jack R.; Sparks, Alton N.; and Leonhardt, Barbara B., to United States of America, Agriculture. Sex attractant for corn earworm moths. 4,216,202, Cl. 424-84.000.

Knechtel, Herbert E.; and Podgurski, Harry H., to United States Steel Corporation. Method of nitriding steel. 4,216,033, Cl. 148-16.600.

Knox, Lloyd C., to Halliburton Company. Platform leg plug. 4,215,951, Cl. 405-203.000.

Koba, Andrei I.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.

Kobayashi, Akio: *See*—
Omura, Morikazu; Kobayashi, Akio; and Okuda, Yukio, 4,216,385, Cl. 307-64.000.

Kobayashi, Hirotsugi: *See*—
Harata, Shoichi; Kobayashi, Hirotsugi; and Hibino, Sohei, 4,216,459, Cl. 340-134.000.

Kobayashi, Kazuo; Nakazumi, Tadataka; Oda, Tatsuro; and Tanaka, Kazuyuki, to Toyo Kogyo Co., Ltd. Exhaust gas purifying apparatus for automobile multi-cylinder engine. 4,215,540, Cl. 60-278.000.

Kobayashi, Kazuo; Oda, Tatsuro; Nakazumi, Tadataka; and Tanaka, Kazuyuki, to Toyo Kogyo Co., Ltd. Exhaust gas purifying apparatus for automobile multi-cylinder engine. 4,215,542, Cl. 60-290.000.

Kobayashi, Kazuo: *See*—
Tanaka, Kazuyuki; Kobayashi, Kazuo; Oda, Tatsuro; and Nakazumi, Tadataka, 4,215,541, Cl. 60-284.000.

Koch, Kenneth K., to International Housing Limited. Method for cast-in-place concrete walls. 4,215,519, Cl. 52-741.000.

Kodras, Rudolph. Process for liquid-liquid sorbent extraction. 4,215,994, Cl. 23-230.00B.

Koehler, Gerard: *See*—
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.

Kofoid, Melvin J., to Air Pollution Systems, Inc. Resistive anode for corona discharge devices. 4,216,000, Cl. 55-138.000.

Kohama, Kazuo; Hashimoto, Akira; Nakamura, Junichi; and Tao, Kazuo, to Meisei Chemical Works, Ltd. Resist printing method. 4,215,988, Cl. 8-448.000.

Kohnhorst, Earl E.: *See*—
Summers, Thomas W.; and Kohnhorst, Earl E., 4,216,080, Cl. 209-469.000.

Kohzuma, Taisaku: *See*—
Matsuda, Yasumasa; Shimada, Satoshi; Kawakami, Kanji; Nishihara, Motohisa; Kohzuma, Taisaku; Sagae, Syoji; Doi, Tetsuo; and Yamada, Takahiro, 4,216,477, Cl. 346-140.00R.

Koike, Ikuya: *See*—
Iwasaki, Norio; Satoh, Toshio; Ito, Hiroyuki; and Koike, Ikuya, 4,216,357, Cl. 179-100.10R.

Kokelenberg, Hendrik E.: *See*—
Sels, Francis J.; Kokelenberg, Hendrik E.; and van Veelen, George F., 4,216,108, Cl. 252-182.000.

Koken Co., Ltd.: *See*—
Akiyama, Taichiro; and Mutou, Fumiyo, 4,215,689, Cl. 128-214.00F.

Kokubo, Eiichi; Miyagawa, Tuyoshi; and Yoshida, Minoru, to Laurel Bank Machine Co., Ltd. Dust collector in a note counting machine. 4,215,811, Cl. 235-98.00R.

Kokusai Densbin Denwa Kabushiki Kaisha: *See*—
Nakabo, Satoru; Wada, Tasaku; and Mihira, Kazumasa, 4,215,946, Cl. 400-689.000.

Kombinat Typowych Elementow Hydrauliki Silowej "Pszl-Hydral": *See*—
Hager, Aleksander; Zajaczkowski, Ryszard; and Adamowicz, Andrzej, 4,215,546, Cl. 60-456.000.

Komitet po Transportno Mashinostroene: *See*—
Penchev, Peter R.; and Gishin, Stoyan S., 4,216,064, Cl. 204-1.00T.
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, to Canon Kabushiki Kaisha. Control device for an intermittently movable driver member. 4,215,588, Cl. 74-113.000.
Konash, Anatoly E.: *See*—
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F., 4,215,562, Cl. 73-15.0FD.
Konig, Klaus: *See*—
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.
Konigl, Georg: *See*—
Feneberg, Paul; Konigl, Georg; Kirchhof, Gunther; and Schatz, Anton, 4,215,933, Cl. 355-50.000.
Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, to Hitachi, Ltd. Bidirectional light-activated thyristor having substrate optical isolation. 4,216,487, Cl. 357-39.000.
Kono, Migaki; Igarashi, Hideaki; and Kishimoto, Kenjiro, to Yuasa Battery Company Limited. Glass fiber separator for storage batteries. 4,216,280, Cl. 429-247.000.
Koralewski, Thomas J.: *See*—
Gladieux, Norman K.; Allen, Carey M.; and Koralewski, Thomas J., 4,216,005, Cl. 65-374.00R.
Koransha Co., Ltd.: *See*—
Kurita, Sumihiko, 4,216,028, Cl. 136-234.000.
Kovacs, Istvan: *See*—
Onodi, Zoltan; Mikola, Sandor; Farkas, Ferenc; and Kovacs, Istvan, 4,215,487, Cl. 34-167.000.
Kovins, Michael. Inflatable instrument case. 4,215,778, Cl. 206-314.000.
Kowa Company, Ltd.: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.
Kozlov, Sergei A.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.
Kozu, Eiji: *See*—
Jinbo, Yoshiji; Kozu, Eiji; and Narita, Hiroshi, 4,216,420, Cl. 318-370.000.
Kraft, Inc.: *See*—
Hermann, Lawrence F., 4,216,243, Cl. 426-583.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Heitmann, Hans-Gunter, 4,216,057, Cl. 176-37.000.
Krapcho, John; and Turk, Chester F., to E. R. Squibb & Sons, Inc. Azo methine containing compounds. 4,216,335, Cl. 560-35.000.
Kraus, Charles E., to Excelermatic, Inc. Traction roller transmission. 4,215,595, Cl. 74-798.000.
Krempl, Peter; Claassen, Peter; and List, Helmut, to List, Hans. Monoaxially oriented piezoelectric polymer transducer for measurement of mechanical values on bodies. 4,216,403, Cl. 310-328.000.
Krendelev, Viktor N.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.
Kreucher, David L., to Wickes Corporation, The. Internal milling machine for milling crank pins. 4,215,962, Cl. 409-241.000.
Krofchak, David. Process for the treatment of incinerated sewage sludge ash. 4,216,012, Cl. 75-101.00R.
Krtous, George F.: *See*—
Ludtke, Gerald W.; Butler, Glenn A.; and Krtous, George F., 4,216,506, Cl. 360-74.100.
Krump, Robert C., to Emerson Electric Co. Battery operated thermostat timer with battery charging circuits. 4,215,815, Cl. 236-46.00R.
Krystek, Michael S.; Hurley, George L., III; Smith, Steven R.; and Rice, Stephen E., to General Atomic Company. Fluid dispensing control system. 4,216,529, Cl. 364-510.000.
Kubik, Donald A.; and Davis, Charles I., to Minnesota Mining and Manufacturing Company. Melt-blown fibrous electrets. 4,215,682, Cl. 128-205.290.
Kubota, Atsushi: *See*—
Sato, Tadashi; and Kubota, Atsushi, 4,215,929, Cl. 355-7.000.
Kuc, Anthony. Wheeled baggage hinge system. 4,215,769, Cl. 190-18.00A.
Kucharewski, Nicholas: *See*—
Gillberg, James E.; and Kucharewski, Nicholas, 4,216,393, Cl. 307-270.000.
Kudryavtsev, Ivan V., deceased: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Kudryavtseva, Galina A., administrator: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Kuhlmann, Herbert. Control valve for viscous materials. 4,215,713, Cl. 137-238.000.
Kuiper, Adrianus; Boelens, Paulus R.; and Blanken, Jacob, to U.S. Philips Corporation. Rapid heating dispenser cathode in a holder and method of manufacturing the same. 4,215,457, Cl. 29-25.140.
Kuiper, Jerald W. Coin operated sliding puck game. 4,215,863, Cl. 273-126.00R.
Kulite Semiconductor Products Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,216,404, Cl. 310-338.000.
Kullmann, Dieter, to Siemens Aktiengesellschaft. Arrangement for cooling an electric machine. 4,216,398, Cl. 310-53.000.
Kunieda, Hisashi: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.
Kunii, Yutaka; Shimoji, Toshikuni; and Jingu, Masaharu, to Tokyo Shibaura Electric Co., Ltd. Ultrasonic scanner. 4,215,585, Cl. 73-633.000.
Kunze, Claus; and Dennhoven, Manfred, to Heimann GmbH. Inspection system for baggage. 4,216,499, Cl. 358-111.000.
Kurahashi, Yoshio: *See*—
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,216,228, Cl. 424-322.000.
Kuraray Co., Ltd.: *See*—
Nishimura, Takeo; and Akamata, Kazundo, 4,216,251, Cl. 427-370.000.
Kurita, Sumihiko, to Koransha Co., Ltd. Thermocouple protecting tube. 4,216,028, Cl. 136-234.000.
Kuroda, Masao; and Kanda, Hiroshi, to Hitachi Medical Corporation. Method for transmission and reception of ultrasonic beams using ultrasonic transducer element array. 4,215,584, Cl. 73-626.000.
Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products Inc. Housing and lead arrangements for electromechanical transducers. 4,216,404, Cl. 310-338.000.
Kusaka, Yukio: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, 4,216,020, Cl. 106-56.000.
Kuypers, Hubert, to Kabel-und Metallwerke Gutehoffnungshuette AG. Corrugation apparatus. 4,215,559, Cl. 72-77.000.
Kysela, Ernst; Lantzsch, Reinhard; and Klauke, Erich, to Bayer Aktiengesellschaft. 1,1-Dichloro-4-methyl-3-hydroxy-pent-1-ene. 4,216,173, Cl. 260-654.00R.
Kyser, Edmond L.; and Sears, Stephan B., to Silonics, Inc. Linear array ink jet assembly. 4,216,483, Cl. 346-140.00R.
Kyusyu Refractories Co., Ltd.: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, 4,216,020, Cl. 106-56.000.
Kyuzaki, Tsutomu: *See*—
Kasuga, Osamu; Omi, Satoru; and Kyuzaki, Tsutomu, 4,216,448, Cl. 333-203.000.
La Voz Corporation: *See*—
Gullota, Leonard, 4,215,838, Cl. 248-121.000.
Laar, Erwin; Sieber, Werner; and Spickenreither, Josef, to AGFA-Gevaert, A.G. Intermixing of fluid in plural tanks while maintaining the fluid levels in the tanks independent. 4,215,719, Cl. 137-563.000.
Lab Products, Inc.: *See*—
Campbell, Neil E., 4,215,650, Cl. 119-18.000.
Laboraton Derivati Organici, S.p.A.: *See*—
Fedeli, Gianfranco; and De Ambrosi, Luigi, 4,216,293, Cl. 435-268.000.
Lahar, Noam; and Shabtai, Joseph, to Yeda Research & Development Co. Ltd. Cross-linked montmorillonite molecular sieves. 4,216,188, Cl. 423-118.000.
Lam, Tim Y.; and Saper, Barry M., to John Fluke Mfg. Co., Inc. Hybrid signature test method and apparatus. 4,216,374, Cl. 371-27.000.
Lamberts, Kurt; Leppin, Jurgen; Greten, Berndt; and Neubauer, Harry, to Bison-werke Bahre & Greten GmbH & Co. KG. Process and an apparatus for the continuous manufacture of boards from material incorporating a heat hardenable binder. 4,216,179, Cl. 264-25.000.
Lancaster, Robert D. Extractor tool. 4,215,458, Cl. 29-213.00R.
Lang, John L. Process for clarifying water. 4,216,086, Cl. 210-47.000.
Lange, Kai, to General Electric Company. Structure for emission tomography scintillation camera. 4,216,381, Cl. 250-363.00S.
Langfield, Edward R.; Hile, James L.; and Hird, David L., to Langfield, Edward R. Hydraulically actuated tool for mechanically splitting rock-like material. 4,215,901, Cl. 299-22.000.
Langlitz, Karlheinz: *See*—
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 4,215,852, Cl. 266-89.000.
Lantzsch, Reinhard: *See*—
Kysela, Ernst; Lantzsch, Reinhard; and Klauke, Erich, 4,216,173, Cl. 260-654.00R.
Larson, Thomas M.; Moring, Thomas B.; and Ireland, M. Sue, to Loew's Theatres, Inc. Nicotine transfer process. 4,215,706, Cl. 131-143.000.
Lau, Edward H., to Redactron Corporation. Motor driven single element printer. 4,215,943, Cl. 400-161.100.
Laue, Charles E. Valve and method of making. 4,215,714, Cl. 137-269.000.
Lauffenburger, Robert F. Aiming device for archery bows and other objects. 4,215,484, Cl. 33-265.000.

Laurel Bank Machine Co., Ltd.: *See—*
Kokubo, Eiichi; Miyagawa, Tuyoshi; and Yoshida, Minoru, 4,215,811, Cl. 235-98.00R.

Lautzenhiser, Theodore V., to Standard Oil Company (Indiana). Dipole mass laser-based gravity gradiometer. 4,215,578, Cl. 73-382.00G.

Lawless, Gregory D.; Hirschhorn, Joel S.; and Andersen, Phillip J., to Abex Corporation. Machine parts of powdered metal. 4,216,270, Cl. 428-567.000.

Lawson, Alexander E.; and Mathieu, Robert J., to Gow-Mac Instrument Co. Miniaturized thermal conductivity detector. 4,215,564, Cl. 73-27.00R.

Lazzari, Jean P.; and Desserre, Jean, to Compagnie Internationale pour l'Informatique. Method of producing a magnetic head platform. 4,215,467, Cl. 29-841.000.

LeBoeuf, Kenneth P. Trolling lure and method of making same. 4,215,506, Cl. 43-42.050.

Leboul, Jean: *See—*
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,216,006, Cl. 71-88.000.

Lee, Kyu T., to Du Pont de Nemours, E. I., and Company. 1-Difluoromethyl-6,7-methylenedioxy-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid. 4,216,324, Cl. 546-90.000.

Lefferts, Peter, to National Semiconductor Corporation. High gain differential amplifier. 4,216,436, Cl. 330-260.000.

Leggeter, Brian E.: *See—*
Davidson, Hugh; Johnson, Keith T.; Leggeter, Brian E.; and Moore, Anthony J., 4,216,105, Cl. 252-174.190.

Le Goff, Yves: *See—*
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,216,006, Cl. 71-88.000.

LeGrand, Jesse S., to International Telephone and Telegraph Corporation. Threshold circuit. 4,216,433, Cl. 328-111.000.

Lehmann, Bernd: *See—*
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.

Leidich, Arthur J., to RCA Corporation. Leakage current compensation circuit. 4,216,394, Cl. 307-296.00R.

Leland Stanford Junior University, The Board of Trustees of: *See—*
Moorer, James A., 4,215,617, Cl. 84-1.030.

Le Ludec, Joel: *See—*
Soula, Gerard; and Le Ludec, Joel, 4,216,171, Cl. 260-584.00B.

LeMaire, Leonard F.: *See—*
Hesch, Harold E.; Wold, Harold A.; and LeMaire, Leonard F., 4,215,515, Cl. 49-218.000.

Lemercier, Guy, to Commissariat a l'Energie Atomique. Protective device for a vessel suspended of a nuclear reactor. 4,216,059, Cl. 176-87.000.

Lemmer, Alfred. Apparatus for perforating a foil. 4,215,610, Cl. 83-565.000.

Lenoir, John: *See—*
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,216,320, Cl. 544-345.000.

Lenthe, Manfred; and Dankert, Gerhard, to Bayer Aktiengesellschaft. Preparation of chlorinated N-methyl-imidazoles and N-methyl-imidazolines. 4,216,332, Cl. 548-337.000.

Leonhardt, Barbara B.: *See—*
Klun, Jerome A.; Plimmer, Jack R.; Sparks, Alton N.; and Leonhardt, Barbara B., 4,216,202, Cl. 424-84.000.

Leppin, Jurgen: *See—*
Lamberts, Kurt; Leppin, Jurgen; Greten, Berndt; and Neubauer, Harry, 4,216,179, Cl. 264-25.000.

Lerintiu, Aurel: *See—*
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.

Leube, Bernt O.: *See—*
Rothman, Ulf S. E.; Frederiksen, Sven C.; and Leube, Bernt O., 4,215,693, Cl. 128-296.000.

Leuven Research & Development V.Z.W.: *See—*
Collen, Desire J., 4,216,291, Cl. 435-7.000.

Lever, Robert J. A. B. Structural element for three-dimensional objects, e.g. furniture. 4,216,255, Cl. 428-57.000.

Leveraus, James E., to Allis-Chalmers Corporation. Indicator lights. 4,216,524, Cl. 362-61.000.

Levesque, Yvon G., to Johnson & Johnson. Absorbent structure. 4,215,692, Cl. 128-287.000.

Levine, Arnold M., to International Telephone and Telegraph Corporation. Pulse frequency modulator and compressor for staircase FM radar systems. 4,216,474, Cl. 343-17.2PC.

Levine, Simon; and Nakach, Alain, to Commissariat a l'Energie Atomique. Mechanically formable composite part. 4,216,258, Cl. 428-209.000.

Levy, John C. Tag. 4,215,497, Cl. 40-10.00R.

Lewis, George D., to United Technologies Corporation. Method and apparatus for reducing nitrous oxide emissions from combustors. 4,215,535, Cl. 60-736.000.

Lewis, Harvie H.; Morganson, Neal E.; and Smialek, Raymond J., to Olin Corporation. Process for purification and recovery of cyanuric acid. 4,216,315, Cl. 544-192.000.

Lewis, Leon L.; and Murray, Michael V., to United States Steel Corporation. Tab for easy-open can end. 4,215,794, Cl. 220-270.000.

Li, Vincent H.: *See—*
Crouther, Ronald; Li, Vincent H.; and Dodge, Larry H., 4,215,700, Cl. 128-763.000.

Libbey-Owens-Ford Company: *See—*
Gladieux, Norman K.; Allen, Carey M.; and Koralewski, Thomas J., 4,216,005, Cl. 65-374.00R.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Wermuth, Jurgen, 4,216,434, Cl. 330-86.000.

Liepmann, Hans-Gunther: *See—*
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.

Likhosherstov, Arkady M.: *See—*
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; Peresada, Vitaly P.; and Chizhov, Konstantin O., 4,216,321, Cl. 544-349.000.

Lillie, Charles R., to TRW Inc. Cutting tool and insert for same. 4,215,955, Cl. 407-42.000.

Lilly Industries Limited: *See—*
Ross, William J.; and Todd, Alec, 4,216,219, Cl. 424-272.000.

Limoni, Uri. Crescent heat exchanger liquid heater. 4,215,655, Cl. 122-136.00R.

Lind, Charles J.: *See—*
Evans, Francis E.; Lind, Charles J.; and Robinson, Martin A., 4,216,168, Cl. 260-567.60M.

Lindauer, Sydney L.: *See—*
Giedd, Gary R.; Karsch, Arthur F.; and Lindauer, Sydney L., 4,216,478, Cl. 346-61.000.

Lindblom, Curtis H.: *See—*
Shriver, Joe E.; and Lindblom, Curtis H., 4,215,527, Cl. 56-98.000.

Lindner, Christian: *See—*
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.

Lindner, Renate G. Reversible basket liner. 4,216,256, Cl. 428-66.000.

Lindsay, Erin J.: *See—*
Antos, John M.; Henke, Arthur W.; Lindsay, Erin J.; and Embach, James T., 4,215,445, Cl. 4-323.000.

Linke, Richard A.; and Schneider, Martin V., to Bell Telephone Laboratories, Incorporated. Millimeter waveguide shorts. 4,216,450, Cl. 333-248.000.

List, Hans: *See—*
Krempl, Peter; Claassen, Peter; and List, Helmut, 4,216,403, Cl. 310-328.000.

List, Helmut: *See—*
Krempl, Peter; Claassen, Peter; and List, Helmut, 4,216,403, Cl. 310-328.000.

Litt, Eric S., to United States of America, Army. Frequency bandwidth tuning system and method. 4,216,546, Cl. 455-164.000.

Little, Carl H., to Weber-Knapp Company. Touch latch. 4,215,884, Cl. 292-220.000.

Littlefield, Reginald D.; and Shinn, Stuart, to Supreme Aluminum Industries, Ltd. Construction module. 4,215,766, Cl. 182-46.000.

Litton Systems, Inc.: *See—*
Ausman, John S., 4,215,621, Cl. 89-1.50E.
Hester, Thomas E., 4,216,455, Cl. 336-160.000.

Lobitz, Walter A.: *See—*
Hagelberg, Allen C.; and Lobitz, Walter A., 4,215,630, Cl. 102-10.000.

Loebach, Ernst W. Method and device for the projection printing of a mask onto a semiconductor substrate. 4,215,935, Cl. 355-67.000.

Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. 3,4-Diaminophenyl sulfonic acid esters. 4,216,161, Cl. 260-456.00A.

Loew's Theatres, Inc.: *See—*
Larson, Thomas M.; Moring, Thomas B.; and Ireland, M. Sue, 4,215,706, Cl. 131-143.000.

Logsdon, Duane D., to Logsdon Foundation, The. Backflow preventer for sewer system. 4,215,724, Cl. 137-852.000.

Logsdon Foundation, The: *See—*
Logsdon, Duane D., 4,215,724, Cl. 137-852.000.

Lohmann GmbH & Co. KG: *See—*
Westip, Wilhelm, 4,215,684, Cl. 128-156.000.

Lohrentz, Howard R.: *See—*
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., 4,215,964, Cl. 414-111.000.

Lohse, Friedrich: *See—*
Gutekunst, Ferdinand; Lohse, Friedrich; and Schmid, Rolf, 4,216,304, Cl. 528-94.000.

Loikitz, Frank F., to Standard Keil Hardware Manufacturing Co. Self-closing hinge. 4,215,449, Cl. 16-50.000.

Lombana, Luis A., to Envirotech Corporation. System for combustion of wet waste materials. 4,215,637, Cl. 110-225.000.

Long, Leonard C. Gear shift lever assembly having ignition system deenergizing means. 4,215,596, Cl. 74-851.000.

Long, Ray S.; and Siemak, John B., to Dow Chemical Company, The. Scrubber scale prevention. 4,216,087, Cl. 210-58.000.

Long, William E.: *See—*
Kitzing, Rainer; Whitear, Brian R. D.; Long, William E.; Reeves, David L. R.; and Wood, Glenn P., 4,216,146, Cl. 260-202.000.

Lord, Thomas J., to United Aircraft Products, Inc. Thermally controlled valve with safety inspection feature. 4,215,816, Cl. 236-99.00E.

Lorenz, Donald H.; Tu, Shu T.; and Wyman, Donald P., to GAF Corporation. Flexible substrates containing a radiation curable coating composition. 4,216,267, Cl. 428-412.000.

Lorenz, Richard; and Martin, Paul E., to United States of America, Navy. Digital electronic commutator for radio direction finding system. 4,216,476, Cl. 343-120.000.

Lorenzoni, Loreno: *See—*
Messina, Giuseppe; Lorenzoni, Loreno; and Di Fiore, Lucio, 4,216,345, Cl. 585-323.000.

Lothian, John S.; and Windram, Michael D., to Independent Broadcasting Authority. Apparatus for detecting and measuring interference in transmission signals. 4,216,496, Cl. 358-83.000.

Loven, Carl K., to Loven Firearms Company. Muzzle-loading firearm. 4,215,502, Cl. 42-61.000.

Loven Firearms Company: *See—*
Loven, Carl K., 4,215,502, Cl. 42-61.000.

Lowe, Richard M.: *See—*
Grant, Clyde P.; and Lowe, Richard M., 4,215,927, Cl. 354-317.000.

Lowther, Frank E., to Purification Sciences Inc. Internal combustion engine. 4,215,659, Cl. 123-68.000.

Lubbers, Dietrich W.; and Opitz, Norbert, to Max Planck Gesellschaft zur forderung der Wissenschaften E.V. Optode arrangement. 4,215,940, Cl. 356-402.000.

Lubrizol Corporation, The: *See—*
Steckel, Thomas F., 4,216,099, Cl. 252-33.600.

Lucas Industries Limited: *See—*
Lynch, Ronald; and Purcell, John H., 4,216,400, Cl. 310-154.000.

Lucia, Antonio: *See—*
Genevois, Jean L.; Piva, Renato; and Lucia, Antonio, 4,215,982, Cl. 432-192.000.

Ludtke, Gerald W.; Butler, Glenn A.; and Krtous, George F., to Bell & Howell Company. Card transport mechansim. 4,216,506, Cl. 360-74.100.

Lumalampan Aktiebolag: *See—*
Bjorkman, Karl A. G.; and Jonsson, Gunther, 4,216,406, Cl. 313-315.000.

Lummerzheim, Konrad: *See—*
Steinwart, Johannes; Lummerzheim, Konrad; Bauder, Armin; and Wilmers, Gottlieb, 4,215,538, Cl. 60-276.000.

Lummus Company, The: *See—*
Simone, Andre A., 4,216,074, Cl. 208-8.0LE.

Lummus Industries, Inc.: *See—*
Hudson, Wilber G.; and Welch, Ronald B., 4,215,607, Cl. 83-111.000.

Lundell, Edwin O.; and Smarook, Walter H., to Union Carbide Corporation. Method of selectively treating a plastic film surface to prevent blocking. 4,216,254, Cl. 428-35.000.

Lundin, Tord R.; and Csiki, Kalman, to Gullfiber AB. Ear-plug. 4,215,683, Cl. 128-152.000.

Lupton, Christopher J.: *See—*
Mueller, K. Karl; and Lupton, Christopher J., 4,215,987, Cl. 8-115.000.

Lustenberger, Hans, to Georg Fischer Aktiengesellschaft. Melt processing apparatus with tiltable melt receptacle. 4,215,854, Cl. 266-240.000.

Luven, Arno: *See—*
Holtermann, Heinz; and Luven, Arno, 4,216,347, Cl. 13-9.00R.

Lynch, Ronald; and Purcell, John H., to Lucas Industries Limited; and Kane, Dalsimer, et al. Permanent magnet electrical machines. 4,216,400, Cl. 310-154.000.

Lythgoe, Alan L.: *See—*
Reed, Kenneth J.; and Lythgoe, Alan L., 4,216,019, Cl. 430-308.000.

M & W Gear Company: *See—*
Bonomo, Melvin E.; Coldren, Kenneth M.; Rathbun, Loren L.; and Towner, Ronald D., 4,215,569, Cl. 73-134.000.

MacGregor International S.A.: *See—*
van de Werken, Pieter, 4,215,848, Cl. 254-107.000.

Machida, Naoki: *See—*
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.

Machnowski, Ryszard: *See—*
Szott, Ryszard; and Machnowski, Ryszard, 4,216,174, Cl. 261-30.000.

Mackal, Glenn H.; and Judd, Edward A. Inflation manifold, method of and apparatus for heading plastic safety pins therein. 4,216,182, Cl. 264-71.000.

Madlener, Bruno, to Establissement Dentaire Ivoclar. Mixing container. 4,215,985, Cl. 433-90.000.

Maeda, Hiroji: *See—*
Ikeda, Hironosuke; Hara, Mitsunori; Narukawa, Satoshi; and Maeda, Hiroji, 4,216,247, Cl. 427-115.000.

Magnesium Elektron Limited: *See—*
Roebuck, Peter; and Petch, James H. T., 4,215,853, Cl. 266-235.000.

Maho Werkzeugmaschinenbau Babel & Co.: *See—*
Babel, Werner, 4,215,961, Cl. 409-231.000.

Mahoney, Patsie. Padded hospital bed siderail cover. 4,215,446, Cl. 5-425.000.

Maier, Walter A.: *See—*
Anderson, Eric A.; and Maier, Walter A., 4,215,613, Cl. 83-864.000.

Maillot, Jean-Pierre: *See—*
Zalkin, Daniel; and Maillot, Jean-Pierre, 4,215,681, Cl. 128-204.210.

Mallon, Joseph R.: *See—*
Kurtz, Anthony D.; and Mallon, Joseph R., 4,216,404, Cl. 310-338.000.

Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, to Nissan Motor Company, Limited. Electronic closed loop air-fuel ratio control system for use with internal combustion engine. 4,215,656, Cl. 123-489.000.

Manfreddi, Renato: *See—*
Garetti, Enzo; and Manfreddi, Renato, 4,216,532, Cl. 365-182.000.

Mangini, Angelo: *See—*
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, 4,216,145, Cl. 260-156.000.

Maniscalco, Joseph P.: *See—*
Allain, Ronald J.; and Maniscalco, Joseph P., 4,216,066, Cl. 204-59.0QM.

Mann, Steven R. Flexible shaft tool head. 4,215,601, Cl. 81-57.130.

Mannesmann Demag AG: *See—*
Borghorst, Friedhelm, 4,215,739, Cl. 164-416.000.

Manservisi, Renato, to CIR-S.p.A.-Divisione SASIB. Transferring and combining device. 4,215,774, Cl. 198-444.000.

Manzke, Klaus; Brotzler, Roland; Berg, Gerhard; and Uhl, Karl, to BASF Aktiengesellschaft. Drive apparatus for magnetic discs. 4,216,510, Cl. 360-99.000.

Marangoni, Roy D.; Gigerenzer, Horst; and Pepper, Roger T., to Fiber Materials, Inc. Acoustic filter. 4,215,764, Cl. 181-286.000.

Marcil, Raymond. Cigarette making machine. 4,215,705, Cl. 131-70.000.

Margittai, Thomas B. Coaxial heat exchanger device. 4,215,743, Cl. 165-141.000.

Mariol, James F., to Design Alliance, Inc. Animated toy block set. 4,215,509, Cl. 46-22.000.

Marotel, Gerard, to Compagnie d'Electronique et de Piezoelectricite C.E.P.E. Device for heat regulation of an enclosure particularly for oscillating piezoelectric crystal, and enclosure comprising such a device. 4,216,371, Cl. 219-501.000.

Marshall, Wilbur A. Drill sharpening gauge. 4,215,483, Cl. 33-201.000.

Martija, Henry M.: *See—*
Grant, Frederic F.; and Martija, Henry M., 4,216,505, Cl. 360-104.000.

Martin, Paul E.: *See—*
Lorenz, Richard; and Martin, Paul E., 4,216,476, Cl. 343-120.000.

Martinez Vera, Enrique R.; and Becerra Novoa, Jorge O., to Hylsa, S.A. Method and apparatus for the secondary gaseous reduction of metal ores. 4,216,011, Cl. 75-91.000.

Marwick, Edward F. Enhanced fission breeder reactor. 4,216,058, Cl. 176-39.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Schmidt, Werner; and Watzek, Gerhard, 4,215,899, Cl. 296-190.000.

Mason, Martin K., to Hewlett-Packard Company. Automatic paper alignment mechanism. 4,216,482, Cl. 346-129.000.

Mathieu, Robert J.: *See—*
Lawson, Alexander E.; and Mathieu, Robert J., 4,215,564, Cl. 73-27.00R.

Matsubara, Isao: *See—*
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.

Matsuda, Takashi; Niwa, Kazuo; and Sumitomo, Yasusuke, to Tokyo Shibaura Electric Co., Ltd. Semiconductor integrated circuit isolated through dielectric material. 4,216,491, Cl. 357-49.000.

Matsuda, Yasumasa; Shimada, Satoshi; Kawakami, Kanji; Nishihara, Motohisa; Kohzuma, Taisaku; Sagae, Syoji; Doi, Tetsuo; and Yamada, Takahiro, to Hitachi, Ltd. Nozzle head of an ink-jet printing apparatus with built-in fluid diodes. 4,216,477, Cl. 346-140.00R.

Matsuda, Yoshio, to Yoshida Kogyo K.K. Net jointing structure. 4,215,453, Cl. 24-205.16C.

Matsui, Akio: *See—*
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,216,014, Cl. 75-128.00C.

Matsui, Masao: *See—*
Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, 4,216,264, Cl. 428-397.000.

Matsumoto, Kazuya, to Canon Kabushiki Kaisha. Method to control introduction of diffracted beam by means of diffraction element. 4,215,924, Cl. 354-59.000.

Matsumoto, Kenji: *See—*
Suzuki, Yasuo; Tamura, Akira; and Matsumoto, Kenji, 4,215,734, Cl. 152-209.0WT.

Matsuo, Yasushi: *See—*
Hattori, Yoshinori; and Matsuo, Yasushi, 4,216,021, Cl. 106-73.200.

Matsuoka, Hideoki: *See—*
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.

Matsushima, Hideo; and Mori, Yasuki, to Abbott Laboratories. 1-N-Acyl-aminoglycoside-XK-88-5. 4,216,309, Cl. 536-17.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Takeuchi, Hiroshi; Inoue, Hideaki; Kawabata, Hidetsugu; and Ishiwatari, Keizo, 4,216,271, Cl. 428-607.000.
Tatsuzawa, Yoshinobu; Sakamoto, Masayuki; and Wasai, Hiromi, 4,216,428, Cl. 375-75.000.

Matsuura, Katsumasa: *See—*
Ichiryu, Ken; Nakamura, Ichiro; and Matsuura, Katsumasa, 4,215,723, Cl. 137-625.630.

Matsuura, Kazuo: *See—*
Ikuta, Shigeru; Matsuura, Kazuo; and Horiuchi, Yoshifumi, 4,216,292, Cl. 435-191.000.

Mattel, Inc.: *See—*
Gay, Derek J.; Trout, Robert G.; Chin, Manuel G. Y.; and Sawyer, James E., 4,215,843, Cl. 249-78.000.

Matty, Thomas C.: *See—*
Anderson, Larry W.; Franz, James H., Jr.; and Matty, Thomas C., 4,216,417, Cl. 318-274.000.

Mauduit, Daniel: *See—*
Esteban, Daniel J.; Galand, Claude R.; Mauduit, Daniel; and Menez, Jean, 4,216,354, Cl. 179-15.55R.

Max Planck Gesellschaft zur forderung der Wissenschaften E.V.: *See—*
Lubbers, Dietrich W.; and Opitz, Norbert, 4,215,940, Cl. 356-402.000.

Maynard, Douglas E. Router guide assembly. 4,215,731, Cl. 144-136.00C.

Mazzaferro, Nicola: *See—*
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, 4,216,145, Cl. 260-156.000.

MB Associates: *See—*
Davenport, Donald E., 4,216,423, Cl. 320-1.000.

McAlpine, James B.: *See—*
Carney, Ronald E.; and McAlpine, James B., 4,216,210, Cl. 424-180.000.

McArthur, James F.: *See—*
Ishman, Neal H.; Buxton, Robert B.; Durst, Duane A.; McArthur, James F.; and Johnson, Michael E., 4,216,497, Cl. 358-84.000.

McCary, L. V., Jr.: *See—*
Hallden, Donald F.; Peters, Clifford M.; and McCary, L. V., Jr., 4,215,746, Cl. 166-53.000.

McCray, Robert J. Pivotable hatch adjuster. 4,215,885, Cl. 292-338.000.

McGill, Robert W.; and Winiasz, Michael E., to A-T-O Inc. Adjustable apparatus for case loading and unloading. 4,215,967, Cl. 414-416.000.

McGrath, William J.; and DiGiacomo, Regis P., to General Electric Company. Patient monitoring and data processing system. 4,216,462, Cl. 340-150.000.

McGraw-Edison Company: *See—*
Charvat, Charles J., 4,216,370, Cl. 219-460.000.
Huggler, Peter E., 4,216,372, Cl. 219-521.000.

McIntosh Laboratory, Inc.: *See—*
Fish, Lawrence W., Jr., 4,216,353, Cl. 179-1.0GJ.

McKay, Dwight L.: *See—*
Nielsen, Richard H.; McKay, Dwight L.; and Dale, Glenn H, 4,216,120, Cl. 252-430.000.

McKean, William T.: *See—*
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., 4,216,054, Cl. 162-57.000.

McKnight, John: *See—*
Waterworth, Norman; Whateley, Eric A.; Shipley, Gerald A.; and McKnight, John, 4,215,755, Cl. 180-6.440.

McLeod, Allan G.: *See—*
Fields, Ronald H.; and McLeod, Allan G., 4,215,750, Cl. 168-4.000.

McMahon, Irven J., Jr., to Coe Manufacturing Company, The. Roller dryer. 4,215,489, Cl. 34-242.000.

McNeil Lab, Inc.: *See—*
Carson, John R.; Carmosin, Richard J.; and Stefanski, Anthony T., 4,216,150, Cl. 260-326.200.

McRowe, Arthur W., to B. F. Goodrich Company, The. Vinyl chloride polymers containing copper oxalate. 4,216,139, Cl. 260-45.75C.

McSpadden, Jeff R., to Control Data Corporation. Programmable polynomial generator. 4,216,540, Cl. 371-37.000.

Mead Corporation, The: *See—*
Monette, William A., 4,216,378, Cl. 250-201.000.
Paranjpe, Suresh C.; and Frey, James A., 4,216,479, Cl. 346-75.000.

Mears, James W., to Grinnell Fire Protection Systems Company, Inc. Finish plate assembly for a sprinkler head having interengaging ramp and arm elements. 4,215,751, Cl. 169-51.000.

Medical Devices, Inc.: *See—*
Spitz, Eugene B.; Brenz, Richard E.; and Hansford, Charles C., 4,215,695, Cl. 128-350.00V.

Mehoudar, Raphael, to Hydro-Plan Engineering Ltd. Drip level irrigation. 4,215,822, Cl. 239-542.000.

Mehta, Dinesh A.: *See—*
Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., 4,216,489, Cl. 357-41.000.

Meijer, Leo, to Ten-O-One Inc. Light efficient display device. 4,215,501, Cl. 40-559.000.

Meiji Seika Kaisha, Ltd.: *See—*
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.

Meisei Chemical Works, Ltd.: *See—*
Kohama, Kazuo; Hashimoto, Akira; Nakamura, Junichi; and Tao, Kazuo, 4,215,988, Cl. 8-448.000.

Mellors, Geoffrey W., to Union Carbide Corporation. Manganese dioxide fluoride-containing cathodes for solid electrolyte cells. 4,216,279, Cl. 429-191.000.

Mendenhall, Robert L. Method and apparatus for recycling asphalt-aggregate compositions. 4,215,941, Cl. 366-25.000.

Menez, Jean: *See—*
Esteban, Daniel J.; Galand, Claude R.; Mauduit, Daniel; and Menez, Jean, 4,216,354, Cl. 179-15.55R.

Mera, Yoichi: *See—*
Kishino, Takao; Yamaguchi, Nobuo; and Mera, Yoichi, 4,216,470, Cl. 340-753.000.

Merck & Co., Inc.: *See—*
Dorn, Conrad P.; and Jones, Howard, 4,216,160, Cl. 260-455.00R.
Shuman, Richard F.; and Tull, Roger J., 4,216,317, Cl. 544-277.000.
Weinstock, Leonard M.; Wildman, Arthur S.; and Bagner, Carl, 4,216,340, Cl. 562-469.000.

Meredith, Michael D.: *See—*
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., 4,216,054, Cl. 162-57.000.

Merle, Joseph J.: *See—*
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,215,648, Cl. 118-622.000.

Merola, Carl R., to Westinghouse Electric Corp. Composite groundable barrier for switchgear. 4,216,521, Cl. 361-345.000.

Merten, Jeff L.: *See—*
Dare, Roy R.; and Merten, Jeff L., 4,215,749, Cl. 166-361.000.

Mesler, Gilbert T. Bow sight. 4,215,485, Cl. 33-265.000.

Messina, Giuseppe; Lorenzoni, Loreno; and Di Fiore, Lucio, to Euteco S.p.A. Preparation of linear alkylbenzenes. 4,216,345, Cl. 585-323.000.

Metal Elio C.A. Una compania de acuerdo con las Leyes Venezolanas: *See—*
De Rossi, Mario, 4,215,661, Cl. 123-587.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Hohmann, Klaus, 4,216,196, Cl. 423-481.000.

Meyerhoff, Mark E.: *See—*
Rechnitz, Garry A.; Arnold, Mark A.; and Meyerhoff, Mark E., 4,216,065, Cl. 204-1.00T.

Mezak, John A.: *See—*
Keane, William J.; and Mezak, John A., 4,216,447, Cl. 333-207.000.

Michalko, Edward, to UOP Inc. Manufacture of high surface area spheroidal alumina particles having a high average bulk density. 4,216,122, Cl. 252-448.000.

Michel, Bernard: *See—*
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.

Miczek, Peter: *See—*
Divjak, August A.; and Miczek, Peter, 4,216,422, Cl. 318-612.000.

Miele, Joseph. Convertible trousers. 4,215,435, Cl. 2-227.000.

Mihira, Kazumasa: *See—*
Nakabo, Satoru; Wada, Tasaku; and Mihira, Kazumasa, 4,215,946, Cl. 400-689.000.

Mikola, Sandor: *See—*
Onodi, Zoltan; Mikola, Sandor; Farkas, Ferenc; and Kovacs, Istvan, 4,215,487, Cl. 34-167.000.

Miles Laboratories, Inc.: *See—*
Johnson, Leighton C., 4,216,245, Cl. 427-2.000.
Turk, Richard S.; and Zaup, Adam P., 4,215,995, Cl. 23-230.00R.

Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, to Kali-Chemie Aktiengesellschaft. 1,3 Diaminopropane derivatives. 4,216,167, Cl. 260-558.00D.

Miller, Adron M.; and Richardson, Harvey J., to RCA Corporation. Intermittent prime film mover using multi-toothed wheel drive. 4,215,921, Cl. 352-187.000.

Miller, Allen W.: *See—*
Carroll, Cornelius F.; Abernathy, Lloyd E.; and Miller, Allen W., 4,215,666, Cl. 124-41.00A.

Miller, Donald E., to Goodyear Tire & Rubber Company, The. Prevention of discoloration in substituted diphenylamines. 4,216,115, Cl. 252-400.00R.

Miller Electric Manufacturing Company: *See—*
Risberg, Robert L., 4,216,367, Cl. 219-132.000.

Miller, George J.: *See—*
Clover, Richmond B.; and Miller, George J., 4,216,541, Cl. 371-38.000.

Miller, Harris R. Monobath processing of color film, including optical sound. 4,216,285, Cl. 430-140.000.

Miller, John A.; Brookshire, Phillip L.; and O'Neil, William J., Jr., to Dow Chemical Company, The. Closing device. 4,215,597, Cl. 81-9.10R.

Miller, John C., to C. A. Lawton Company. Method and apparatus for linear and nonlinear control of a hydraulic press. 4,215,543, Cl. 60-327.000.

Miller, John W. V.; and Ringlien, James A., to Owens-Illinois, Inc. Glue drop detector. 4,215,939, Cl. 356-371.000.

Miller, Joseph E. Calcined clay containing dielectric coating composition. 4,216,106, Cl. 252-63.500.

Miller, Sammy L., to General Electric Company. Method of making a stator connection assembly. 4,215,464, Cl. 29-596.000.

Mills, King L.: *See—*
Vanderveen, John W.; and Mills, King L., 4,216,193, Cl. 423-456.000.

Mimura, Akitoshi: *See—*
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.

Mineau, Paul J. Water aerator. 4,216,091, Cl. 210-175.000.

Minnesota Mining and Manufacturing Company: *See—*
Brochman, Wilfred R., 4,215,791, Cl. 220-258.000.
Kubik, Donald A.; and Davis, Charles I., 4,215,682, Cl. 128-205.290.
Schams, Ronald T.; and Brown, James N., 4,216,257, Cl. 428-93.000.
Schmit, Paul F., 4,216,050, Cl. 156-494.000.
Seemann, Ronald W.; and Bradshaw, Thomas I., 4,216,180, Cl. 264-35.000.

Minoura, Kazuo, to Canon Kabushiki Kaisha. High speed scanning device for scanning the same area plural times by a beam deflected by a single deflecting surface. 4,215,912, Cl. 350-6.800.

Mitchell, Glen. Solar energy operated hydrogen refining process. 4,216,067, Cl. 204-129.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Amagasa, Nobutada, 4,216,514, Cl. 361-20.000.
Hotta, Shigenori; Baba, Sadaaki; and Takahashi, Masaru, 4,216,456, Cl. 337-114.000.

Mitsubishi Gas Chemical Co., Inc.: *See—*
Baba, Makoto; Ninomiya, Teruyuki; and Ono, Chieko, 4,216,337, Cl. 560-78.000.

Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See—*
Murata, Hidemi; Fujishiro, Koretoshi; Hiraga, Shunsaku; and Hiyoshi, Masamitu, 4,216,060, Cl. 202-139.000.

Mitsubishi Monsanto Chemical Company: *See—*
Hasegawa, Shinichi; and Fujita, Hisanori, 4,216,484, Cl. 357-17.000.

Mitsuura, Yaeko: *See—*
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, 4,216,240, Cl. 426-516.000.

Miyagawa, Tuyoshi: *See—*
Kokubo, Eiichi; Miyagawa, Tuyoshi; and Yoshida, Minoru, 4,215,811, Cl. 235-98.00R.

Miyagawa, Yoshitaka: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,215,902, Cl. 303-119.000.

Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, to Ricoh Company, Limited. Method of maintaining the correct conditions of an electrophotographically duplicated image. 4,215,930, Cl. 355-14.00D.

Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Method of making alloy and carbide powders of molybdenum and tungsten. 4,216,009, Cl. 75-0.5AB.

Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, to Sumitomo Electric Industries, Ltd. Process for the production of a hard solid solution. 4,216,034, Cl. 148-20.300.

Miyamoto, Koichi: *See—*
Komori, Shigehiro; Hattori, Hiroyuki; Inuzuka, Tsuneki; and Miyamoto, Koichi, 4,215,588, Cl. 74-113.000.

Miyashita, Kiyoshi: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,215,931, Cl. 355-14.00R.

Miyauchi, Kajunori: *See—*
Yamasaki, Akitoshi; and Miyauchi, Kajunori, 4,215,972, Cl. 414-742.000.

Mizoshita, Fumitaka: *See—*
Uozumi, Yukio; and Mizoshita, Fumitaka, 4,215,837, Cl. 246-433.000.

Mizote, Masanori: *See—*
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.

Mizukuchi, Yutaka, to Citizen Watch Co., Ltd. Liquid crystal composition and method for making same. 4,216,109, Cl. 252-299.000.

Mobil Oil Corporation: *See—*
Canterino, Peter J., 4,216,301, Cl. 526-229.000.
Jones, Daniel G., 4,216,334, Cl. 548-352.000.
Stournas, Stamoulis, 4,216,097, Cl. 252-8.55D.
Vlcek, Richard J., 4,215,567, Cl. 73-61.10R.

Mochida, Yasunori: *See—*
Nishizawa, Jun-ichi; Mochida, Yasunori; Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,216,038, Cl. 148-187.000.

Moeller, Kurt G. F. Shock crush sub-foundation. 4,215,645, Cl. 114-336.000.

Moeller, Richard E., to General Electric Company. Solventless release coating. 4,216,252, Cl. 427-387.000.

Mogi, Takaaki: *See—*
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.

Molby, Lloyd A., to ATP Inc. Hydrostatic system with over control compensation. 4,215,547, Cl. 60-465.000.

Molins Machine Company, Inc.: *See—*
Coburn, Robert E.; and Buinewicz, Benedict R., 4,215,609, Cl. 83-492.000.

Monette, William A., to Mead Corporation, The. Optical scanner. 4,216,378, Cl. 250-201.000.

Mong, William K.: *See—*
Scott, Daniel G.; and Mong, William K., 4,215,881, Cl. 285-68.000.

Monsanto Company: *See—*
Dahms, Ronald H., 4,216,295, Cl. 521-112.000.

Montalbano, Carlo: *See—*
Davis, Danny L., 4,215,809, Cl. 228-48.000.

Montante, Louis L.: *See—*
Farrell, Eugene A.; and Montante, Louis L., 4,215,494, Cl. 37-42.00R.

Montedison S.p.A.: *See—*
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, 4,216,145, Cl. 260-156.000.

Monti, Anthony. Sugar crystallization process. 4,216,025, Cl. 127-61.000.

Mookherjee, Braja D.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.

Moore, Anthony J.: *See—*
Davidson, Hugh; Johnson, Keith T.; Leggeter, Brian E.; and Moore, Anthony J., 4,216,105, Cl. 252-174.190.

Moorer, James A., to Leland Stanford Junior University, The Board of Trustees of. Musical instrument and method for generating musical sound. 4,215,617, Cl. 84-1.030.

Moran, Thomas F., Jr.; and Volgyesy, Ivan L., to Indian Head Inc. Electrical wall box. 4,215,787, Cl. 220-3.600.

More, Henry S., to Exploration Logging, Inc. Transmitting well logging data. 4,216,536, Cl. 367-83.000.

Morello, Lorenzo; and Castelli, Pier G., to Centro Ricerche Fiat S.p.A. Hydraulic system for transmitting power from an internal combustion engine to the wheels of a motor vehicle. 4,215,545, Cl. 60-413.000.

Morford, Gary W.; Jamieson, Guy; and Gould, Kenneth D. Oscillating cut-out tool. 4,215,475, Cl. 30-272.00R.

Morganson, Neal E.: *See—*
Lewis, Harvie H.; Morganson, Neal E.; and Smialek, Raymond J., 4,216,315, Cl. 544-192.000.

Mori, Masaharu: *See—*
Amazawa, Kiyoshi; Mori, Masaharu; and Taniyama, Takashi, 4,216,430, Cl. 455-219.000.

Mori, Yasuki: *See—*
Matsushima, Hideo; and Mori, Yasuki, 4,216,309, Cl. 536-17.00R.

Moring, Thomas B.: *See—*
Larson, Thomas M.; Moring, Thomas B.; and Ireland, M. Sue, 4,215,706, Cl. 131-143.000.

Morioka, Yuji, to Sanyo Electric Co., Ltd. Process for preparation of electrode for alkaline battery. 4,216,045, Cl. 156-242.000.

Morishita, Teru, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition torch. 4,215,979, Cl. 431-264.000.

Morris, Charles M., Sr. Truck transmission with power take-off. 4,215,586, Cl. 74-15.200.

Morton-Norwich Products, Inc.: *See—*
Wright, George C., 4,216,327, Cl. 546-306.000.

Moskvin, Nikolai F.: *See—*
Gavrilin, Evgeny F.; Belokur, Alexandr N.; Daiker, Artur L.; Konash, Anatoly E.; Basov, Vladislav V.; and Moskvin, Nikolai F., 4,215,562, Cl. 73-15.0FD.

Moss, Gerald, to United States of America, Environmental Protection Agency. Converting calcium sulphide to calcium oxide. 4,216,197, Cl. 423-638.000.

Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, to Bridgestone Tire Company Limited. Structure for reinforcing bead sections of radial tires for heavy loads. 4,215,737, Cl. 152-362.00R.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Dinger, Hans; and Schulmeister, Robert, 4,215,550, Cl. 60-606.000.

Motorenfabrik Hatz GmbH & Co. KG: *See—*
Hatz, Ernst, 4,215,664, Cl. 123-195.00C.

Motorola, Inc.: *See—*
Backof, Charles A., Jr.; and Robins, David S., 4,216,463, Cl. 340-171.00R.
Bethards, Charles W., 4,216,427, Cl. 455-119.000.
Carter, Ernest A., 4,216,389, Cl. 307-247.00R.
Iwer, Herbert W., 4,216,446, Cl. 333-112.000.

Mroz, Joseph A. Finger ring securement device. 4,215,556, Cl. 63-15.600.

MTD Products Inc.: *See—*
Nofel, Thomas J., 4,216,363, Cl. 200-157.000.

Muchel, Franz; and Strahle, Fritz, to Carl Zeiss-Stiftung. Optical system having a radial difference in refractive index. 4,215,914, Cl. 350-175.0GN.

Mueller, Hans R.; and Secretin, Marie-Christine, to Societe d'Assistance Technique pour Produits Nestle S.A. Infant milk formula and process for its manufacture. 4,216,236, Cl. 426-72.000.

Mueller, Helmut: *See—*
Graul, Juergen; and Mueller, Helmut, 4,216,030, Cl. 148-1.500.

Mueller, K. Karl; and Lupton, Christopher J., to Cotton Incorporated. Process for chemically imparting a durable, multiple-level, pile height to terry towelling, terry fabric and cut pile cotton fabric. 4,215,987, Cl. 8-115.000.

Muller, Hans-Ueli: *See—*
Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, 4,215,782, Cl. 206-525.000.

Muller, Werner: *See—*
Heinzer, Hans; and Muller, Werner, 4,215,520, Cl. 53-173.000.

Multi-Fuel Energy Systems, Inc.: *See—*
Kerch, Ronald C., 4,215,669, Cl. 126-99.00R.

Multisafe AG: *See—*
Hirmann, Georg; and Kagi, Bruno, 4,216,469, Cl. 340-666.000.

Murata, Hidemi; Fujishiro, Koretoshi; Hiraga, Shunsaku; and Hiyoshi, Masamitu, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Horizontal type coke ovens. 4,216,060, Cl. 202-139.000.

Murray, Michael V.: *See—*
Lewis, Leon L.; and Murray, Michael V., 4,215,794, Cl. 220-270.000.

Mutou, Fumiyo: *See—*
Akiyama, Taichiro; and Mutou, Fumiyo, 4,215,689, Cl. 128-214.00F.

N. A. Woodworth Company: *See—*
Toth, Paul; and Cross, Kenneth O., 4,215,605, Cl. 82-40.00R.

N.F. Udviklingscenter A/S: *See—*
Nielsen, Ejvind R., 4,215,805, Cl. 226-97.000.

Nabisco, Inc.: *See*—
Puchalski, Theodore J., Jr.; Albrecht, Robert J.; and Pinto, Albert A., 4,215,969, Cl. 414-571.000.

Naderi, Iraj; and Naderi, Mahboobeh. Animal litter collector. 4,215,886, Cl. 294-1.00B.

Naderi, Mahboobeh: *See*—
Naderi, Iraj; and Naderi, Mahboobeh, 4,215,886, Cl. 294-1.00B.

Nadolsky, Isaac, to Bohanna & Pearce, Inc. Fireplace grate. 4,215,671, Cl. 126-164.000.

Nagakura, Masahiko: *See*—
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, 4,216,225, Cl. 424-287.000.

Nagao, Shigeru: *See*—
Sato, Toshio; and Nagao, Shigeru, 4,215,992, Cl. 8-445.000.

Nagrotzki, Karl-Heinz, to Nordischer Maschinenbau Rud. Baader GmbH & Co. KG. Device for nobbing and gutting fish. 4,215,452, Cl. 17-60.000.

Naito, Hiroshi: *See*—
Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, 4,216,264, Cl. 428-397.000.

Nakabo, Satoru; Wada, Tasaku; and Mihira, Kazumasa, to Kokusai Denshin Denwa Kabushiki Kaisha. Impact receiving structure for impact type printing mechanism. 4,215,946, Cl. 400-689.000.

Nakach, Alain: *See*—
Levine, Simon; and Nakach, Alain, 4,216,258, Cl. 428-209.000.

Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Kimiaki, to Otsuka Pharmaceutical Co., Ltd. Platelet aggregation inhibiting 2-oxyindoles, their compositions and method of use. 4,216,220, Cl. 424-274.000.

Nakajima, Kazutsugu: *See*—
Nakayama, Motohiro; and Nakajima, Kazutsugu, 4,216,250, Cl. 427-289.000.

Nakamatsu, Yoshiro. Golfclub. 4,215,860, Cl. 273-81.00R.

Nakamura, Ichiro: *See*—
Ichiryu, Ken; Nakamura, Ichiro; and Matsuura, Katsumasa, 4,215,723, Cl. 137-625.630.

Nakamura, Junichi: *See*—
Kohama, Kazuo; Hashimoto, Akira; Nakamura, Junichi; and Tao, Kazuo, 4,215,988, Cl. 8-448.000.

Nakanishi Metal Works Co., Ltd.: *See*—
Wakabayashi, Takao, 4,215,905, Cl. 308-182.000.

Nakano, Minol: *See*—
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,009, Cl. 75-0.5AB.
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,034, Cl. 148-20.300.

Nakashita, Mitsuo: *See*—
Agui, Hideo; Saji, Ikutaro; and Nakashita, Mitsuo, 4,216,333, Cl. 548-345.000.

Nakaso, Akishi: *See*—
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, 4,216,246, Cl. 427-43.100.

Nakayama, Motohiro; and Nakajima, Kazutsugu, to Nippon Steel Corporation. Method for producing a steel sheet having a zinc coating on one side. 4,216,250, Cl. 427-289.000.

Nakazumi, Tadataka: *See*—
Kobayashi, Kazuo; Nakazumi, Tadataka; Oda, Tatsuro; and Tanaka, Kazuyuki, 4,215,540, Cl. 60-278.000.
Kobayashi, Kazuo; Oda, Tatsuro; Nakazumi, Tadataka; and Tanaka, Kazuyuki, 4,215,542, Cl. 60-290.000.
Tanaka, Kazuyuki; Kobayashi, Kazuo; Oda, Tatsuro; and Nakazumi, Tadataka, 4,215,541, Cl. 60-284.000.

Nalco Chemical Co.: *See*—
Allain, Ronald J.; and Maniscalco, Joseph P., 4,216,066, Cl. 204-59.00QM.

Nara, Takashi: *See*—
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.

Narita, Hiroshi: *See*—
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Narukawa, Satoshi: *See*—
Ikeda, Hironosuke; Hara, Mitsunori; Narukawa, Satoshi; and Maeda, Hiroji, 4,216,247, Cl. 427-115.000.

Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, to Kanebo, Ltd. Conductive composite filaments. 4,216,264, Cl. 428-397.000.

National Research Development Corporation: *See*—
Hopkinson, Peter R., 4,215,818, Cl. 239-3.000.

National Semiconductor Corporation: *See*—
Boettcher, Charles E., 4,216,386, Cl. 307-221.00D.
Lefferts, Peter, 4,216,436, Cl. 330-260.000.

National Starch and Chemical Corporation: *See*—
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,216,310, Cl. 536-109.000.

Natwick, Vernon R., to Ramtek Corporation. Targets and gated firing guns for propelling balls thereto. 4,215,867, Cl. 273-357.000.

Nauchno-Issledovatelsky Institut Farmakologii: *See*—
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; Peresada, Vitaly P.; and Chizhov, Konstantin O., 4,216,321, Cl. 544-349.000.

NDT Instruments, Inc.: *See*—
Botsco, Ronald J.; Todd, John E.; and Jones, Robert L., 4,215,583, Cl. 73-582.000.

Neely, James E., Jr., to PPG Industries, Inc. Method for making β-form aluminum trimetaphosphate. 4,216,190, Cl. 423-314.000.

Neilson, Peter J.; and Pickering, William J., to Eltra Corporation. Electro-optical scanning. 4,216,495, Cl. 358-80.000.

Nelson, James T.: *See*—
Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., 4,216,489, Cl. 357-41.000.

Nemeth, Joseph J. Electronic tennis game. 4,215,861, Cl. 273-85.00G.

Nesterova, Olga M.: *See*—
Juferov, Anatoly M.; Shakhova, Galina I.; and Nesterova, Olga M., 4,216,088, Cl. 210-59.000.

Neubauer, Harry: *See*—
Lamberts, Kurt; Leppin, Jurgen; Greten, Berndt; and Neubauer, Harry, 4,216,179, Cl. 264-25.000.

Neumann, Borys, to Worthington Pump, Inc. Turbine-impeller pump for use in geothermal energy recovery systems. 4,215,976, Cl. 417-409.000.

Newcombe, Jack, to Cities Service Company. Emulsion breaking with surfactant recovery. 4,216,079, Cl. 208-188.000.

Newman, Alec T.; and Rhodes, David, to General Foods Limited. Vending machine valve structure. 4,215,801, Cl. 222-63.000.

NGK Spark Plug Co., Ltd.: *See*—
Hattori, Yoshinori; and Matsuo, Yasushi, 4,216,021, Cl. 106-73.200.

Nguyen, Vu H.: *See*—
O'Rell, Dennis D.; Palmer, Nigel I.; and Nguyen, Vu H., 4,216,281, Cl. 429-252.000.

NHK Spring Co., Ltd.: *See*—
Shiguma, Heijiro; Takahashi, Jun; Sakai, Yoshihiro; and Ohno, Akira, 4,215,558, Cl. 72-9.000.

Nichols, David L. Word puzzle game. 4,215,864, Cl. 273-153.00R.

Nichols Engineering & Research Corp.: *See*—
von Dreusche, Charles F., Jr., 4,215,981, Cl. 432-139.000.

Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., to Davy Powergas, Inc. Sulfur dioxide removal process. 4,216,189, Cl. 423-242.000.

Niedermeyer, Karl O. Sump pump with air column therein when pump is not operating. 4,215,975, Cl. 417-53.000.

Nielsen, Ejvind R., to N.F. Udviklingscenter A/S. Propelling head for the pneumatic propelling of a multifilament tow. 4,215,805, Cl. 226-97.000.

Nielsen, Richard H.; McKay, Dwight L.; and Dale, Glenn H, to Phillips Petroleum Company. Antimony containing fine plus cracking catalyst composition. 4,216,120, Cl. 252-430.000.

Nigrelli, Biagio J., to Johns-Nigrelli-Johns. Tray forming machine. 4,215,525, Cl. 53-580.000.

Ninomiya, Teruyuki: *See*—
Baba, Makoto; Ninomiya, Teruyuki; and Ono, Chieko, 4,216,337, Cl. 560-78.000.

Nippon Electric Co., Ltd.: *See*—
Kasuga, Osamu; Omi, Satoru; and Kyuzaki, Tsutomu, 4,216,448, Cl. 333-203.000.
Sato, Hisaaki; Shintani, Morio; Shinozaki, Takayoshi; Tsuchiya, Takuichi; and Asai, Toshio, 4,216,409, Cl. 315-5.460.
Shimonou, Shigeru; and Inada, Hiroshi, 4,216,415, Cl. 318-600.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Chibana, Masanobu, 4,215,614, Cl. 84-1.010.
Nishizawa, Jun-ichi; Mochida, Yasunori; Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,216,038, Cl. 148-187.000.

Nippon Oil Company, Ltd.: *See*—
Yuasa, Hitoshi; and Imai, Hirosuke, 4,216,307, Cl. 528-422.000.

Nippon Soken, Inc.: *See*—
Akita, Sigeyuki; and Wakamatsu, Hisato, 4,215,575, Cl. 73-339.00A.
Akita, Sigeyuki, 4,215,582, Cl. 73-579.000.

Nippon Steel Corporation: *See*—
Nakayama, Motohiro; and Nakajima, Kazutsugu, 4,216,250, Cl. 427-289.000.

Nippon Telegraph and Telephone Public Corporation: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimada, Katsumi, 4,216,533, Cl. 365-230.000.
Tatsuzawa, Yoshinobu; Sakamoto, Masayuki; and Wasai, Hiromi, 4,216,428, Cl. 375-75.000.

Nishihara, Motohisa: *See*—
Matsuda, Yasumasa; Shimada, Satoshi; Kawakami, Kanji; Nishihara, Motohisa; Kohzuma, Taisaku; Sagae, Syoji; Doi, Tetsuo; and Yamada, Takahiro, 4,216,477, Cl. 346-140.00R.

Nishikawa, Masaji: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,215,931, Cl. 355-14.00R.

Nishimura, Itsuro; and Ohgishi, Tsutomu, to Sanyo Electric Co., Ltd. Variable capacitance device having a plurality of capacitance elements and a plurality of switching elements therefor formed on a single common substrate. 4,216,451, Cl. 334-15.000.

Nishimura, Takeo; and Akamata, Kazundo, to Kuraray Co., Ltd. Method of producing a leather-like sheet material having a high-quality feeling. 4,216,251, Cl. 427-370.000.

Nishiyama, Ryuzo; Haga, Takahiro; and Sakashita, Nobuyuki, to Ishihara Sangyo Kaisha, Ltd. 4-[4-(5-Trifluoromethyl-2-pyridyloxy)-phenoxy]-2-pentenoic acid esters useful as a herbicide. 4,216,007, Cl. 71-094.000.

Nishizawa, Jun-ichi; Mochida, Yasunori; Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, to Nippon Gakki Seizo Kabushiki Kaisha. Semiconductor device and manufacturing process thereof. 4,216,038, Cl. 148-187.000.

Nissan Motor Company, Limited: *See*—
Fukasawa, Noburu, 4,215,647, Cl. 116-286.000.

Manaka, Nobuzi; Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; and Ezoe, Mituhiko, 4,215,656, Cl. 123-489.000.
Shono, Kinji; and Suzuki, Kunihiko, 4,215,593, Cl. 74-665.00D.
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.
Nissin Kogyo Kabushiki Kaisha: *See*—
Seki, Masayuki, 4,215,768, Cl. 188-73.300.
Nittan Company, Limited: *See*—
Hasegawa, Mitsuo; Shinohara, Yoshinori; Suzuki, Takashi; and Yokota, Akira, 4,216,377, Cl. 250-574.000.
Niwa, Kazuo: *See*—
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NL Industries, Inc.: *See*—
Dillon, Edward T.; and Duncan, Lloyd W., 4,216,076, Cl. 208-48.0AA.
Finlayson, Claude M., 4,216,135, Cl. 260-40.00R.
Jefferies, Robert K.; and Egbert, Gary L., 4,215,643, Cl. 114-218.000.
Nofel, Thomas J., to MTD Products Inc. Handle safety switch. 4,216,363, Cl. 200-157.000.
Nomura, Hiroyuki: *See*—
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.
Nonaka, Terumoto: *See*—
Nishizawa, Jun-ichi; Mochida, Yasunori; Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,216,038, Cl. 148-187.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co. KG: *See*—
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Norfin, Inc.: *See*—
Gerbracht, Osceola J., 4,215,529, Cl. 57-6.000.
Norlin Industries, Inc.: *See*—
Gross, Glenn M., 4,215,616, Cl. 84-1.010.
Norris, Alan H.: *See*—
Chambley, Phillip W.; and Norris, Alan H., 4,215,642, Cl. 112-410.000.
Northern Telecom Limited: *See*—
Boleda, Alberto; and Wakerly, John F., 4,216,544, Cl. 375-119.000.
Novicky, Nick N., to Tsuetaki, George F. Oxygen-permeable contact lens compositions, methods and articles of manufacture. 4,216,303, Cl. 528-32.000.
Novinger, Donald A., to Danly Machine Corporation. Pattern-controlled routing machine. 4,215,732, Cl. 144-145.00A.
Nozaki, Shinya; and Suzuki, Shouichi, to Diesel Kiki Co., Ltd. Fuel injection apparatus for diesel engines. 4,215,662, Cl. 123-447.000.
Nussdorfer, Theodore J.: *See*—
Poirier, Armand R.; Nussdorfer, Theodore J.; and Stewart, John H., 4,215,553, Cl. 60-650.000.
Nuwayser, Elie S., to Abcor, Inc. Dental-caries detector. 4,215,698, Cl. 128-734.000.
Nykopp, Erik A., to J. M. Voith GmbH. Paper machine having a water extraction box extension. 4,216,056, Cl. 162-300.000.
O.K. Machine and Tool Corp.: *See*—
Greco, Paul L., 4,215,468, Cl. 29-764.000.
Obata, Akira: *See*—
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Oda, Kazutaka; and Okishi, Yoshio, to Fuji Photo Film Co., Ltd. Process for the production of printing plates. 4,216,289, Cl. 430-302.000.
Oda, Tatsuro: *See*—
Kobayashi, Kazuo; Nakazumi, Tadataka; Oda, Tatsuro; and Tanaka, Kazuyuki, 4,215,540, Cl. 60-278.000.
Kobayashi, Kazuo; Oda, Tatsuro; Nakazumi, Tadataka; and Tanaka, Kazuyuki, 4,215,542, Cl. 60-290.000.
Tanaka, Kazuyuki; and Oda, Tatsuro, 4,215,539, Cl. 60-278.000.
Tanaka, Kazuyuki; Kobayashi, Kazuo; Oda, Tatsuro; and Nakazumi, Tadataka, 4,215,541, Cl. 60-284.000.
Office National d'Etudes et de Recherches Aerospatiales (ONERA): *See*—
Boulay, Jean-Louis; and Hoarau, Roland J., 4,216,519, Cl. 361-218.000.
Ofusa, Masaatsu, to Yoshida Kogyo K.K. Woven fastener stringer. 4,215,729, Cl. 139-384.00B.
Og Ogiken Co., Ltd.: *See*—
Okuda, Iwao, 4,215,680, Cl. 128-33.000.
Ohgishi, Tsutomu: *See*—
Nishimura, Itsuro; and Ohgishi, Tsutomu, 4,216,451, Cl. 334-15.000.
Ohki, Toshimi, to Kabushiki Kaisha Daini Seikosha. Method of making static induction transistor logic. 4,216,029, Cl. 148-1.500.
Ohki, Toshimi, to Kabushiki Kaisha Daini Seikosha. Static induction transistor. 4,216,490, Cl. 357-43.000.
Ohkuma, Tsuneo: *See*—
Ikari, Yoshikatsu; Yokoyama, Shoichiro; Itaya, Ryutaro; and Ohkuma, Tsuneo, 4,216,084, Cl. 210-32.000.
Ohmura, Ryuichi, to Fuji Kogyo K.K. Line guide for a fishing rod. 4,215,504, Cl. 43-24.000.
Ohno, Akira: *See*—
Shiguma, Heijiro; Takahashi, Jun; Sakai, Yoshihiro; and Ohno, Akira, 4,215,558, Cl. 72-9.000.
Ohshima, Shigeru; and Sekiguchi, Takeshi, to Canon Kabushiki Kaisha. Television camera with bias light. 4,216,494, Cl. 358-55.000.
Ohtani, Yoshio; and Kakishima, Todomu, to Diesel Kiki Co., Ltd. Plunger-type electro-magnetic actuator. 4,216,454, Cl. 335-262.000.
Ohya, Zenichiro: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Oikado, Taizo: *See*—
Seki, Fumio; and Oikado, Taizo, 4,216,438, Cl. 331-94.50D.
Oka, Kimiaki: *See*—
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Kimiaki, 4,216,220, Cl. 424-274.000.
Oka, Takashi: *See*—
Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, 4,216,530, Cl. 364-565.000.
Okachi, Ryo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.
Okamoto, Kazuo: *See*—
Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, 4,216,264, Cl. 428-397.000.
Okamura, Katsutoshi: *See*—
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, 4,216,240, Cl. 426-516.000.
Okamura, Masahiro: *See*—
Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,216,487, Cl. 357-39.000.
Okamura, Toshiro: *See*—
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, 4,216,246, Cl. 427-43.100.
Okishi, Yoshio: *See*—
Oda, Kazutaka; and Okishi, Yoshio, 4,216,289, Cl. 430-302.000.
Okuda, Iwao, to Og Ogiken Co., Ltd. Chair for hypnotherapy. 4,215,680, Cl. 128-33.000.
Okuda, Yukio: *See*—
Omura, Morikazu; Kobayashi, Akio; and Okuda, Yukio, 4,216,385, Cl. 307-64.000.
Olin Corporation: *See*—
Dempsey, Martin H.; and Rooney, James F., 4,216,364, Cl. 200-164.00R.
Gaule, Gerhard K.; Yarwood, John C.; and Tyler, Derek E., 4,215,738, Cl. 164-49.000.
Kadija, Igor V., 4,216,072, Cl. 204-252.000.
Lewis, Harvie H.; Morganson, Neal E.; and Smialek, Raymond J., 4,216,315, Cl. 544-192.000.
Olsen, Axel. Electrical terminal clamp for establishing an electrically conducting clamping connection. 4,215,909, Cl. 339-97.00R.
Olsen, Eric H. Game apparatus. 4,215,858, Cl. 273-1.00R.
Olson, Don C., to Shell Oil Company. Detector for trace lead in gasolines. 4,216,069, Cl. 204-195.00R.
Olympus Optical Co., Ltd.: *See*—
Sato, Masaaki; and Saito, Shinichi, 4,216,509, Cl. 360-94.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,215,931, Cl. 355-14.00R.
Omi, Satoru: *See*—
Kasuga, Osamu; Omi, Satoru; and Kyuzaki, Tsutomu, 4,216,448, Cl. 333-203.000.
Omura, Morikazu; Kobayashi, Akio; and Okuda, Yukio, to Sawafuji Electric Co., Ltd. AC/DC Power supply device. 4,216,385, Cl. 307-64.000.
O'Neil, William J., Jr.: *See*—
Miller, John A.; Brookshire, Phillip L.; and O'Neil, William J., Jr., 4,215,597, Cl. 81-9.10R.
Onnenberg, Volker: *See*—
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.
Ono, Chieko: *See*—
Baba, Makoto; Ninomiya, Teruyuki; and Ono, Chieko, 4,216,337, Cl. 560-78.000.
Ono, Yaichro: *See*—
Otsuki, Susumi; Yamada, Shizuo; and Ono, Yaichro, 4,216,323, Cl. 544-352.000.
Onodi, Zoltan; Mikola, Sandor; Farkas, Ferenc; and Kovacs, Istvan, to Szolnok Megyei Tegla- es Cserepipari Vallalat. Drying equipment. 4,215,487, Cl. 34-167.000.
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., to Gulf Research & Development Company. Selective hydrogenation of certain nitroaromatic hydroxy substituted acetylenes over a heterogeneous RuS_2 catalyst. 4,216,341, Cl. 568-705.000.
Opitz, Norbert: *See*—
Lubbers, Dietrich W.; and Opitz, Norbert, 4,215,940, Cl. 356-402.000.
O'Rell, Dennis D.; Palmer, Nigel I.; and Nguyen, Vu H., to W. R. Grace & Co. Battery separator. 4,216,281, Cl. 429-252.000.
O'Rell, Michael K.: *See*—
Vaughan, Robert W.; O'Rell, Michael K.; and Sheppard, Clyde H., 4,216,297, Cl. 525-334.000.
Oreopoulos, Dimitrios G.; and Zellerman, Gabor. Medical needle. 4,215,690, Cl. 128-221.000.
Ornsteen Chemicals, Inc.: *See*—
Ornsteen, Robert L., 4,215,802, Cl. 222-146.00H.

Ornsteen, Robert L., to Ornsteen Chemicals, Inc. Adhesive gun having needle valve nozzle. 4,215,802, Cl. 222-146.00H.
Osagawa, Takao: *See*—
Naruse, Tsutomu; Osagawa, Takao; Naito, Hiroshi; Matsui, Masao; and Okamoto, Kazuo, 4,216,264, Cl. 428-397.000.
Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych "BOSMAL": *See*—
Szott, Ryszard; and Machnowski, Ryszard, 4,216,174, Cl. 261-30.000.
Oswald, Leo A., to Owens-Corning Fiberglas Corporation. Method and apparatus for depositing material into a moving receptacle. 4,215,730, Cl. 141-1.000.
Otis, Harold R.; Blake, Charles E.; and Schmidt, Paul J., to Rea Magnet Wire Co., Inc. Magnet wire. 4,216,263, Cl. 428-383.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Kimiaki, 4,216,220, Cl. 424-274.000.
Otsuki, Susumi; Yamada, Shizuo; and Ono, Yaichro, to Toyo Soda Manufacturing Company, Limited. Separation and recovery of 1,4-diazabicyclo-(2,2,2)-octane. 4,216,323, Cl. 544-352.000.
Otto, Jeffrey B., to Rogers Corporation. Polyurethane foam product and process of manufacture thereof from thermosetting frothed mixture. 4,216,177, Cl. 264-25.000.
Owens-Corning Fiberglas Corporation: *See*—
Harris, David A., 4,215,765, Cl. 181-287.000.
Oswald, Leo A., 4,215,730, Cl. 141-1.000.
Owens-Illinois, Inc.: *See*—
Amberg, Stephen W.; and Amberg, Ralph G., 4,215,460, Cl. 29-429.000.
Elser, William F., 4,215,795, Cl. 220-276.000.
Miller, John W. V.; and Ringlien, James A., 4,215,939, Cl. 356-371.000.
Oxoid Limited: *See*—
Swaine, Derwent, 4,215,799, Cl. 221-93.000.
Oxy Metal Industries Corporation: *See*—
Clauss, Richard J., 4,216,272, Cl. 428-632.000.
Pace, Clare A.; and Pringle, Ronald E., to Camco, Incorporated. Lock-out for a well injection valve. 4,215,748, Cl. 166-322.000.
Packard, George. Anti-spill lid. 4,215,793, Cl. 220-270.000.
Page, Derrick J., to Westinghouse Electric Corp. Optical transistor structure. 4,216,485, Cl. 357-19.000.
Page, Harold R. S.: *See*—
Boon, Arthur G.; and Page, Harold R. S., 4,216,089, Cl. 210-63.00R.
Paget, Charles J.; Chamberlin, James W.; and Wikel, James W., to Eli Lilly and Company. Antiviral thiazinyl benzimidazoles. 4,216,313, Cl. 544-55.000.
Palmer, Nigel I.: *See*—
O'Rell, Dennis D.; Palmer, Nigel I.; and Nguyen, Vu H., 4,216,281, Cl. 429-252.000.
Pampus, Gottfried: *See*—
Sylvester, Gerd; Beck, Manfred; Witte, Josef; and Pampus, Gottfried, 4,216,121, Cl. 252-431.00C.
Panaro, Robert J., to Gould Inc. Electric fuse having folded fusible element and heat dams. 4,216,457, Cl. 337-160.000.
Panzeca, Salvatore: *See*—
Davis, Danny L., 4,215,809, Cl. 228-48.000.
Pappas, Dennis G. Prosthesis for ossicular chain reconstruction. 4,215,438, Cl. 3-1.900.
Paranjpe, Suresh C.; and Frey, James A., to Mead Corporation, The. Resistively coated deflection ribbon for an ink jet printing device. 4,216,479, Cl. 346-75.000.
Pare, Maurice; and Coste, Christian, to Degremont. Ozone generation device and electrode. 4,216,096, Cl. 250-539.000.
Parker, Alonzo E., Jr. Shackling system for live poultry. 4,215,654, Cl. 119-97.00R.
Parmelee, Edward E.: *See*—
Gavin, Douglas L.; and Parmelee, Edward E., 4,215,888, Cl. 294-1.00B.
Parsons, James D., to Union Tank Car Company. Railroad tank car and method for transporting liquids. 4,215,788, Cl. 220-22.000.
Parsons, Ward H. Apparatus and method for loading a floating vessel with flowable material. 4,215,965, Cl. 414-139.000.
Partridge, Harold D.: *See*—
Jaszka, Daniel J.; and Partridge, Harold D., 4,216,195, Cl. 423-478.000.
Pasko, Walter J., to General Electric Company. Resonant sound attenuator for transformers. 4,215,763, Cl. 181-202.000.
Pastorino, Ronald L.: *See*—
Halle, Reidar; and Pastorino, Ronald L., 4,216,294, Cl. 521-99.000.
Patalidis, Claude A.: *See*—
Godeux, Michel, 4,215,574, Cl. 73-314.000.
Patel, Bhupendra C., to Kendall Company, The. Position indicating device. 4,215,699, Cl. 128-748.000.
Patel, Dhiru, to Barber-Colman Company. Reed opener assembly. 4,215,455, Cl. 28-204.000.
Patel, Jayant K.: *See*—
Wurzburg, Otto B.; Jarowenko, Wadym; Rubens, Roger W.; and Patel, Jayant K., 4,216,310, Cl. 536-109.000.
Patterson, Edwin A.: *See*—
Ritter, Don D.; Patterson, Edwin A.; and Pigg, Henry M., 4,215,807, Cl. 227-21.000.
Patterson, Michael F.; and Acharya, Arun, to Union Carbide Corporation. Container for cryogenic liquid. 4,215,798, Cl. 220-421.000.
Patton, John T., Jr.: *See*—
Vogt, Herwart C.; Brizgys, Bernardas; Cenker, Moses; and Patton, John T., Jr., 4,216,107, Cl. 252-182.000.
Payne, Robert D.: *See*—
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., 4,215,648, Cl. 118-622.000.
Pearce, Charles W.: *See*—
Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., 4,216,489, Cl. 357-41.000.
Pearce, Francis H. Incubator suitable for use in hatching eggs. 4,215,651, Cl. 119-36.000.
Peel, James R. Support apparatus for chain saw. 4,215,612, Cl. 83-796.000.
Penchev, Peter R.; and Gishin, Stoyan S., to Komitet po Transportno Mashinostroene. Method of assessment of the effect of current periodical polarity inversion in electrochemical processes. 4,216,064, Cl. 204-1.00T.
Penco, Sergio; Gozzi, Fausto; Angelucci, Francesco; and Arcamone, Federico, to Farmitalia Carlo Erba S.p.A. Substituted antitumor anthracyclines. 4,216,157, Cl. 260-365.000.
Pendleton, Darrell D., to Garlock Inc. Splined shaft seal article and apparatus. 4,215,869, Cl. 277-12.000.
Penn Fishing Tackle Mfg. Co.: *See*—
Henze, Walter J.; and Purcell, William, 4,215,505, Cl. 43-27.400.
Pennwalt Corporation: *See*—
Cushman, Robert H.; Hart, Fred W., Jr.; Kircher, David R.; and Ciavattoni, Anthony, 4,216,383, Cl. 250-439.00P.
Pentel Kabushiki Kaisha: *See*—
Horie, Itsuo; and Wada, Yoshihiro, 4,215,948, Cl. 401-265.000.
Pepper, Roger T.: *See*—
Marangoni, Roy D.; Gigerenzer, Horst; and Pepper, Roger T., 4,215,764, Cl. 181-286.000.
Peresada, Vitaly P.: *See*—
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; Peresada, Vitaly P.; and Chizhov, Konstantin O., 4,216,321, Cl. 544-349.000.
Perkasie Industries Corporation: *See*—
Everson, William, 4,215,517, Cl. 52-202.000.
Perkins, Patrick W. Wall bracket assembly. 4,215,784, Cl. 211-105.200.
Perraud, Raymond J., to Envirotech Corporation. Device for injecting cartridges of resin for bolting apparatus. 4,215,953, Cl. 405-303.000.
Perrot, Frieddrich, to Eta A. G. Ebauches-Fabrik. Mechanical watch movement. 4,215,532, Cl. 368-168.000.
Petch, James H. T.: *See*—
Roebuck, Peter; and Petch, James H. T., 4,215,853, Cl. 266-235.000.
Petel, Maurice: *See*—
Holzapfel, Georg; and Petel, Maurice, 4,216,124, Cl. 252-518.000.
Petelle, James F.: *See*—
Flygstad, Dean W.; and Petelle, James F., 4,216,507, Cl. 360-92.000.
Peters, Clifford M.: *See*—
Hallden, Donald F.; Peters, Clifford M.; and McCary, L. V., Jr., 4,215,746, Cl. 166-53.000.
Peyrot, Jean-Pierre. Machine for welding provided with a rotary platform. 4,216,365, Cl. 219-60.00A.
Pfeifer, William, to Armstrong Store Fixture Corporation. Basket with self-locking handle. 4,215,789, Cl. 220-96.000.
Pfizer Inc.: *See*—
Ross, Barry C.; and Shroot, Braham, 4,216,215, Cl. 424-246.000.
Pfohl, Martha C. Burgee apron. 4,215,433, Cl. 2-48.000.
Phaal, Cornelius. Abrasive compact with a core of high rigidity material. 4,215,999, Cl. 51-295.000.
Philagro: *See*—
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,216,006, Cl. 71-88.000.
Philip Morris Incorporated: *See*—
Secor, Henry V., 4,216,329, Cl. 546-334.000.
Philipson, Stanley J. Harmless sonic toy. 4,215,512, Cl. 46-195.000.
Phillips, Albert J. Safety barrier for recreational vehicle doorway. 4,215,895, Cl. 296-202.000.
Phillips Petroleum Company: *See*—
Bost, Howard W.; and Yokley, Tommey A., Jr., 4,216,138, Cl. 260-45.75B.
Clardy, Edwin K.; and Ayers, Buell O., 4,215,563, Cl. 73-23.100.
Drake, Charles A., 4,216,169, Cl. 260-583.00P.
Nielsen, Richard H.; McKay, Dwight L.; and Dale, Glenn H, 4,216,120, Cl. 252-430.000.
Regier, Robert B., 4,216,194, Cl. 423-459.000.
Stapp, Paul R., 4,216,119, Cl. 252-429.00R.
Vanderveen, John W.; and Mills, King L., 4,216,193, Cl. 423-456.000.
Pick, George G.: *See*—
Szabo, Francis S.; and Pick, George G., 4,215,922, Cl. 354-5.000.
Pickering, William J.: *See*—
Neilson, Peter J.; and Pickering, William J., 4,216,495, Cl. 358-80.000.
Pierburg GmbH & Co. KG, Firma: *See*—
Schauer, Walter, 4,216,175, Cl. 261-39.00D.
Pierce, Everette M., to United States of America, Army. Smokeless propellant compositions having polyester or polybutadiene binder system crosslinked with nitrocellulose. 4,216,039, Cl. 149-19.400.
Pigg, Henry M.: *See*—
Ritter, Don D.; Patterson, Edwin A.; and Pigg, Henry M., 4,215,807, Cl. 227-21.000.

Pike, Daniel W.: *See*—
Haase, Reinhold A.; Brockelsby, Norman D.; and Pike, Daniel W., 4,215,850, Cl. 254-350.000.
Pilati, Oliver H. Golf game. 4,215,865, Cl. 273-176.0FA.
Pinna Corporation: *See*—
Britt, John P., 4,215,606, Cl. 83-23.000.
Pinto, Albert A.: *See*—
Puchalski, Theodore J., Jr.; Albrecht, Robert J.; and Pinto, Albert A., 4,215,969, Cl. 414-571.000.
Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, to Swiss Aluminium Ltd. Filler metal for welding aluminum alloys. 4,216,016, Cl. 75-141.000.
Pirovano, Camillo. Watering-trough for chickens and like fowl. 4,215,653, Cl. 119-81.000.
Piva, Renato: *See*—
Genevois, Jean L.; Piva, Renato; and Lucia, Antonio, 4,215,982, Cl. 432-192.000.
Pivot Punch Corporation: *See*—
Herlan, Alton G., 4,215,608, Cl. 83-139.000.
Plas, Jean J., to Societe Anonyme des Etablissements Adrien De Backer. System for sequentially operating flash lamps in repeated sequences. 4,216,413, Cl. 315-323.000.
Plessey Handel und Investments AG: *See*—
Turley, Wilfred H.; and Robinson, John A., 4,215,913, Cl. 350-96.210.
Plimmer, Jack R.: *See*—
Klun, Jerome A.; Plimmer, Jack R.; Sparks, Alton N.; and Leonhardt, Barbara B., 4,216,202, Cl. 424-84.000.
Plumlee, Karl W.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Hydrogenation of petroleum liquids using quinone catalysts. 4,216,078, Cl. 208-143.000.
Pochon, Philippe: *See*—
Baum, Laszlo; and Pochon, Philippe, 4,216,325, Cl. 546-225.000.
Podgurski, Harry H.: *See*—
Knechtel, Herbert E.; and Podgurski, Harry H., 4,216,033, Cl. 148-16.600.
Pohl, Louis. Ball-bearing arrangements. 4,215,907, Cl. 308-189.00A.
Pohl, Walter J., to General Electric Company. Frost control system. 4,215,554, Cl. 62-156.000.
Poiget, Gilbert: *See*—
Farge, Daniel; Leboul, Jean; Le Goff, Yves; and Poiget, Gilbert, 4,216,006, Cl. 71-88.000.
Poirier, Armand R.; Nussdorfer, Theodore J.; and Stewart, John H., to Sanders Associates, Inc. Energy conversion system. 4,215,553, Cl. 60-650.000.
Polaroid Corporation: *See*—
Bilofsky, Ruth C.; and Rogers, Howard G., 4,216,018, Cl. 430-207.000.
Poliak, Richard M.: *See*—
Bakos, Peter; Haggett, Roger E.; and Poliak, Richard M., 4,216,035, Cl. 148-23.000.
Polozov, Boris V.: *See*—
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zorislav N., 4,216,024, Cl. 106-308.00Q.
Poly-Glas Systems: *See*—
Hetherington, Robert D.; and Goelz, David W., 4,215,721, Cl. 137-606.000.
Polyakov, Zorislav N.: *See*—
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zorislav N., 4,216,024, Cl. 106-308.00Q.
Pond, Charles R.; and Hall, Richard B., to Boeing Company, The. Apparatus for accomplishing spectral line selection in lasers by retroreflective feedback. 4,216,439, Cl. 331-94.50C.
Pop, Ioan: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.
Popov, Alexandr D.; Solomin, Vladimir A.; Khantimirov, Sergei S.; and Shirikov, Alexandr A. Linear induction motor. 4,216,397, Cl. 310-13.000.
Popov, Yan Y.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Poss Design Limited: *See*—
Poss, Werner, 4,215,450, Cl. 17-11.000.
Poss, Werner, to Poss Design Limited. Skinning machine. 4,215,450, Cl. 17-11.000.
Powell, John L.; Rekemeyer, Peter C.; and Falk, Earl E., to Union Carbide Corporation. Recovery of ammonium decavanadate from aqueous solution. 4,216,053, Cl. 159-48.00R.
PPG Industries, Inc.: *See*—
Caripolti, Richard A., 4,215,461, Cl. 29-432.000.
Neely, James E., Jr., 4,216,190, Cl. 423-314.000.
PQ Corporation: *See*—
Campbell, Thomas C.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,216,125, Cl. 252-527.000.
Press, Jeffery B.: *See*—
Hofmann, Corris M.; Press, Jeffery B.; and Safir, Sidney R., 4,216,148, Cl. 260-243.300.
Press Seal Gasket Corporation: *See*—
Skinner, Harry W.; and Burdick, Alan D., 4,215,868, Cl. 277-1.000.
Price, Harold, to G-P Manufacturing Co., Inc. Method and means for attaching accessory fender to automotive vehicle. 4,215,873, Cl. 280-153.00R.
Primachenko, Oleg N.: *See*—
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zorislav N., 4,216,024, Cl. 106-308.00Q.
Pringle, Ronald E.: *See*—
Pace, Clare A.; and Pringle, Ronald E., 4,215,748, Cl. 166-322.000.
Pritchett, George. Folding utility cart. 4,215,877, Cl. 280-652.000.
Procter, Donald: *See*—
Rawlings, Robert M.; and Procter, Donald, 4,216,234, Cl. 426-2.000.
Procter & Gamble Company, The: *See*—
Flora, Lawrence; and Francis, Marion D., 4,216,212, Cl. 424-204.000.
Francis, Marion D., 4,216,211, Cl. 424-204.000.
Wages, Dwight E., 4,216,027, Cl. 134-36.000.
PRODESIN (Productos Esteve Internacional S.A.): *See*—
Esteve Subirana, Antonio; and Esteve Soler, Jose, 4,216,214, Cl. 424-244.000.
Produits Chimiques Ugine Kuhlmann: *See*—
Ailloud, Pierre; and D'Haussy, Philippe, 4,216,063, Cl. 203-91.000.
Proksch, Gary J.; and Bonderman, Dean P. Lipoprotein diluent or solution and method useful in the preparation of assay reference materials. 4,216,117, Cl. 252-408.000.
Propper Manufacturing Co., Inc.: *See*—
Heine, Helmut A.; and Erfurt, Werner E., 4,215,678, Cl. 128-6.000.
Proter S.p.A.: *See*—
De Barbieri, Augusto, 4,216,208, Cl. 424-177.000.
Przybylla, Fritz: *See*—
Seufert, Wilhelm; Gnadig, Gerhard; Przybylla, Fritz; Christen, Wolfgang; and Grimminger, Albert, 4,215,942, Cl. 366-343.000.
Pshenichny, Vladimir M.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Puchalski, Theodore J., Jr.; Albrecht, Robert J.; and Pinto, Albert A., to Nabisco, Inc. Load handling apparatus. 4,215,969, Cl. 414-571.000.
Pullman Incorporated: *See*—
Hesch, Harold E.; Wold, Harold A.; and LeMaire, Leonard F., 4,215,515, Cl. 49-218.000.
Purcell, John H.: *See*—
Lynch, Ronald; and Purcell, John H., 4,216,400, Cl. 310-154.000.
Purcell, William: *See*—
Henze, Walter J.; and Purcell, William, 4,215,505, Cl. 43-27.400.
Purdue Research Foundation: *See*—
Griffing, Bruce F.; and Shivashankar, Srinivasarao A., 4,215,577, Cl. 73-362.0SC.
Purex Corporation: *See*—
Barrett, John H., Jr.; and Formeloza, Elizabeth F., 4,215,990, Cl. 8-107.000.
Purification Sciences Inc.: *See*—
Lowther, Frank E., 4,215,659, Cl. 123-68.000.
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, to Centrala Industriala de Medicamente Cosmetice Coloranti si Lacuri. Method and composition for treatment of gastro-duodenal ulcers. 4,216,207, Cl. 424-164.000.
Pustell, Robert A.: *See*—
Tassie, Douglas P.; and Pustell, Robert A., 4,215,620, Cl. 86-1.00R.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., to Rockwell International Corporation. Optical temperature sensor utilizing birefringent crystals. 4,215,576, Cl. 73-356.000.
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; and Schraven, Eckhard, to Cassella Farbwerke Mainkur Aktiengesellschaft. N-Aryloxypropyl-N'-dioxopyrimidyl-α,ω-alkylenediamines. 4,216,314, Cl. 544-123.000.
Rabe, Hansjurgen: *See*—
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.
Rabone Chesterman Limited: *See*—
Boyllin, John A., 4,215,829, Cl. 242-107.000.
Radowitz, Markus, to Armour Pharmaceutical. Process of preparing a serum protein composition for intravenous application. 4,216,205, Cl. 424-101.000.
Rahn, John P.; and Hughes, Richard S., to United States of America, Navy. Surface acoustic wave tuning for lasers. 4,216,440, Cl. 331-94.50C.
Raitto, Russell G., to Concord Laboratories, Inc. Elastomeric plunger tip for a syringe. 4,215,701, Cl. 128-763.000.
Ramioulle, Jean: *See*—
Couteau, Willy; and Ramioulle, Jean, 4,216,339, Cl. 560-232.000.
Ramsay, John P., to GTE Sylvania Incorporated. Percussively-ignitable flashlamp assembly and selective firing mechanism therefor. 4,215,980, Cl. 431-359.000.
Ramtek Corporation: *See*—
Natwick, Vernon R., 4,215,867, Cl. 273-357.000.
Rao, Bhaskara M. L.; and Klemann, Lawrence P., to Exxon Research & Engineering Co. Method of making anhydrous lithium thiocyanate. 4,216,192, Cl. 423-366.000.
Rapid Mounting & Finishing Company: *See*—
Babberl, Marion G., 4,215,840, Cl. 248-221.400.

Raskin, Paul, to General Pneumatics Corporation. Poppet valve. 4,215,715, Cl. 137-505.180.

Rathbun, Loren L.: *See—*
Bonomo, Melvin E.; Coldren, Kenneth M.; Rathbun, Loren L.; and Towner, Ronald D., 4,215,569, Cl. 73-134.000.

Rathbun, Richard H.; and Hildebrandt, William J., to Stanley Works, The. Tape measure reel lock. 4,215,828, Cl. 242-84.800.

Raven, M. Robert. High-pressure hand-held cutting implement. 4,215,472, Cl. 30-164.950.

Rawlings, Robert M.; and Procter, Donald, to Blue Wing Corporation. Lipid encapsulated feed supplement and process for producing same. 4,216,234, Cl. 426-2.000.

Raybestos-Manhattan, Inc.: *See—*
Blair, W. Roscoe, 4,215,518, Cl. 52-658.000.

Rayburn, Lloyd M. Lifting tool. 4,215,889, Cl. 294-16.000.

Raymond, Douglas W.; and Garrett, Thomas C., to Zehntel, Inc. In-circuit digital tester. 4,216,539, Cl. 371-20.000.

RCA Corporation: *See—*
Ahmed, Adel A. A., 4,216,435, Cl. 330-254.000.
Balaban, Alvin R.; and Steckler, Steven A., 4,216,396, Cl. 307-353.000.
Bell, Alan E., 4,216,501, Cl. 358-128.500.
Easter, Finis C., 4,216,441, Cl. 331-111.000.
Fox, Edward C., 4,216,502, Cl. 358-176.000.
Gillberg, James E.; and Kucharewski, Nicholas, 4,216,393, Cl. 307-270.000.
Harford, Jack R., 4,216,523, Cl. 361-393.000.
Leidich, Arthur J., 4,216,394, Cl. 307-296.00R.
Miller, Adron M.; and Richardson, Harvey J., 4,215,921, Cl. 352-187.000.
Stewart, Roger G., 4,216,390, Cl. 307-264.000.
Vaccaro, Frank E., 4,216,407, Cl. 313-422.000.
Wheatley, Carl F., Jr., 4,216,442, Cl. 331-113.00R.
Wilson, Robert E., 4,216,388, Cl. 307-234.000.

Rea Magnet Wire Co., Inc.: *See—*
Otis, Harold R.; Blake, Charles E.; and Schmidt, Paul J., 4,216,263, Cl. 428-383.000.

Reale, Salvatore, to Sunergy Corporation. Cooking grate. 4,215,670, Cl. 126-164.000.

Reba, Imants, to Crown Zellerbach Corporation. System for dispersing and transporting particulate matter. 4,215,956, Cl. 406-152.000.

Rechnitz, Garry A.; Arnold, Mark A.; and Meyerhoff, Mark E., to University of Delaware. Bio-selective electrode probes using tissue slices. 4,216,065, Cl. 204-1.00T.

Redactron Corporation: *See—*
Lau, Edward H., 4,215,943, Cl. 400-161.100.

Reddy, Thomas B.: *See—*
Giglia, Robert D.; and Reddy, Thomas B., 4,215,917, Cl. 350-357.000.

Reed, Kenneth J.; and Lythgoe, Alan L., to Reed, Kenneth James. Photographically produced stencils. 4,216,019, Cl. 430-308.000.

Reed, Kenneth James: *See—*
Reed, Kenneth J.; and Lythgoe, Alan L., 4,216,019, Cl. 430-308.000.

Reed, Lockwood W. Sawtooth waveform generator. 4,216,387, Cl. 307-228.000.

Reeves, David L. R.: *See—*
Kitzing, Rainer; Whitear, Brian R. D.; Long, William E.; Reeves, David L. R.; and Wood, Glenn P., 4,216,146, Cl. 260-202.000.

Regie Nationale des Usines Renault: *See—*
Itey-Bernard, Georges, 4,215,971, Cl. 414-696.000.

Regier, Robert B., to Phillips Petroleum Company. Method of producing methane and carbon. 4,216,194, Cl. 423-459.000.

Reichley, Joseph P. Dental suction device. 4,215,984, Cl. 433-93.000.

Reid, Gilbert R., to Burroughs Corporation. Multiple solder pre-form with non-fusible web. 4,216,350, Cl. 174-68.500.

Rekemeyer, Peter C.: *See—*
Powell, John L.; Rekemeyer, Peter C.; and Falk, Earl E., 4,216,053, Cl. 159-48.00R.

Reliable Electric Company: *See—*
Burtelson, Frederick W., 4,216,369, Cl. 219-411.000.

Remcor Products Company: *See—*
Schafer, Albert L., 4,215,803, Cl. 222-240.000.

Renger, Udo, to Volkswagenwerk Aktiengesellschaft. Injection device for an internal combustion engine. 4,215,820, Cl. 239-90.000.

Research Products Company: *See—*
Allen, James R.; and Friemel, Wolfgang F., 4,215,508, Cl. 43-125.000.

Reynolds Metals Company: *See—*
Kibby, Robert M., 4,216,010, Cl. 75-68.00A.

Rhodes, David: *See—*
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Bonnebat, Claude; and Halna du Fretay, Gerard, 4,216,253, Cl. 428-35.000.
Soula, Gerard, 4,216,170, Cl. 260-583.0EE.
Soula, Gerard; and Le Ludec, Joel, 4,216,171, Cl. 260-584.00B.

Ribble, Franklin; and Russell, G. Kenneth, to Wilkerson Corporation. Guard for compressed air fitting bowl. 4,215,790, Cl. 220-240.000.

Rice, Stephen E.: *See—*
Krystek, Michael S.; Hurley, George L., III; Smith, Steven R.; and Rice, Stephen E., 4,216,529, Cl. 364-510.000.

Richard Hirschmann, Radiotechnisches Werk: *See—*
Bossert, Theodor T., 4,216,429, Cl. 455-148.000.

Richardson, Harvey J.: *See—*
Miller, Adron M.; and Richardson, Harvey J., 4,215,921, Cl. 352-187.000.

Ricoh Company, Limited: *See—*
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, 4,215,930, Cl. 355-14.00D.

Rieger, Hansjorg; and Weidler, Erhard. Tire protector device. 4,215,733, Cl. 152-171.000.

Riemann, Werner: *See—*
Schindler, Johannes G.; and Riemann, Werner, 4,216,068, Cl. 204-195.00R.

Riess, Guido. Arrangement for the shock-absorbent mounting and support of a dental superstructure. 4,215,986, Cl. 433-173.000.

Rigge, Ronald J.; Beadle, Burton J.; and Belding, William A., to Kaiser Aluminum & Chemical Corporation. Bauxite as flame-retardant filler for polymer compositions. 4,216,130, Cl. 260-29.70R.

Riggs, Roger E.; and Shell, Michael D., to Thermal Dynamics, Inc. Radiant electromagnetic energy collector. 4,215,674, Cl. 126-438.000.

Riley, Robert L. Sheet metal drafting device. 4,215,481, Cl. 33-174.00N.

Ringlien, James A.: *See—*
Miller, John W. V.; and Ringlien, James A., 4,215,939, Cl. 356-371.000.

Riollet, Gilbert; and Bruneau, Jacques, to Alsthom-Atlantique. Method for the operation of a power generating assembly. 4,215,552, Cl. 60-646.000.

Risberg, Robert L., to Miller Electric Manufacturing Company. Wireless remote control for electric welder. 4,216,367, Cl. 219-132.000.

Ritter, Don D.; Patterson, Edwin A.; and Pigg, Henry M., to Dennison Manufacturing Company. Insertion means for flexible filaments. 4,215,807, Cl. 227-21.000.

Rivier, Jean E. F.; and Galyean, Robert F., to Salk Institute for Biological Studies, The. Method for cyclization of peptides. 4,216,141, Cl. 260-112.50R.

Robert Bosch GmbH: *See—*
Eblen, Ewald, 4,215,821, Cl. 239-533.400.

Roberts, Marvin A.; and Wary, Joseph C. Film loop apparatus. 4,215,827, Cl. 242-55.010.

Roberts, Sidney J.: *See—*
Huschle, Robert J.; and Roberts, Sidney J., 4,215,516, Cl. 51-399.000.

Robertson, Harry J. Medical protein hydrolysate, process of making the same and processes of utilizing the protein hydrolysate to aid in healing traumatized areas. 4,216,204, Cl. 424-95.000.

Robertson, James D., to Westinghouse Electric Corp. Digital computer implementation of a logic director or sequencer. 4,216,528, Cl. 364-468.000.

Robins, David S.: *See—*
Backof, Charles A., Jr.; and Robins, David S., 4,216,463, Cl. 340-171.00R.

Robinson, John A.: *See—*
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Robinson, Martin A.: *See—*
Evans, Francis E.; Lind, Charles J.; and Robinson, Martin A., 4,216,168, Cl. 260-567.60M.

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Rockwell International Corporation: *See—*
Cagle, George C.; and Bloom, Roger A., 4,216,543, Cl. 375-95.000.
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,215,576, Cl. 73-356.000.
Winocur, Joseph, 4,215,936, Cl. 356-5.000.

Rocky Mountain Sheet Metal Company, Inc.: *See—*
Erickson, Donald P., 4,215,677, Cl. 126-450.000.

Rod Pierce & Associates: *See—*
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,215,800, Cl. 221-129.000.

Roebuck, Peter; and Petch, James H. T., to Magnesium Elektron Limited. Stirring means. 4,215,853, Cl. 266-235.000.

Rogers Corporation: *See—*
Otto, Jeffrey B., 4,216,177, Cl. 264-25.000.

Rogers, Howard G.: *See—*
Bilofsky, Ruth C.; and Rogers, Howard G., 4,216,018, Cl. 430-207.000.

Rogers, Norman H.: *See—*
Clayton, John P.; Rogers, Norman H.; and Coulton, Steven, 4,216,223, Cl. 424-283.000.

Rogier, Edgar R., to Henkel Corporation. High molecular weight polyhydric alcohols. 4,216,343, Cl. 568-853.000.

Rogier, Edgar R., to Henkel Corporation. High molecular weight polyol mixtures. 4,216,344, Cl. 568-853.000.

Romand, Paul: *See—*
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Rooney, James F.: *See—*
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Roos, Ernst; and Hugl, Erika, to Bayer Aktiengesellschaft. Process for the preparation of 2,6-di-tert.-alkyl-4-alkylidene-2,5-cyclohexadienones. 4,216,158, Cl. 260-396.00N.

Rosaen, Borje O.; and Fosdick, Dale P. Relief valve. 4,215,718, Cl. 137-543.190.

Rose, Carl J.: *See—*
Cole, William G.; Goudie, Alexander C.; and Rose, Carl J., 4,216,232, Cl. 424-331.000.

Rosenberger, Michael, to Hoffmann-La Roche Inc. Furyl substituted polyenes. 4,216,312, Cl. 542-427.000.
Rosenblad, Axel E., to Rosenblad Corporation. Selective condensation process and condenser apparatus. 4,216,002, Cl. 55-267.000.
Rosenblad Corporation: *See—*
Rosenblad, Axel E., 4,216,002, Cl. 55-267.000.
Rosof, Barry H.: *See—*
Hickl, Anthony J.; and Rosof, Barry H., 4,216,015, Cl. 75-134.00F.
Ross, Barry C.; and Shroot, Braham, to Pfizer Inc. 7[(Furanyl-2-acetamido)-2-acetamido]cephalosporin derivatives. 4,216,215, Cl. 424-246.000.
Ross, William J.; and Todd, Alec, to Lilly Industries Limited. Dimeric oxazole derivatives. 4,216,219, Cl. 424-272.000.
Rossi, Alberto: *See—*
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,216,155, Cl. 260-345.200.
Rothman, Ulf S. E.; Frederiksen, Sven C.; and Leube, Bernt O. Biological surgical dressing. 4,215,693, Cl. 128-296.000.
Rowley, William N.: *See—*
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Rubens, Roger W.: *See—*
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Rucker, Klaus G., to United States of America, Navy. Sealed pyrotechnic delay. 4,215,631, Cl. 102-27.00R.
Rudolph, Peter K. C., to Boeing Company, The. Gas turbine mixer apparatus. 4,215,536, Cl. 60-262.000.
Ruff, Henry J., to Sala International AB. Dynamic dense media separator. 4,216,095, Cl. 210-512.00R.
Russell, G. Kenneth: *See—*
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Russell, Harry J. Adjustable fishing lure bill. 4,215,507, Cl. 43-42.220.
Rustin, Jesse L. Circulation assist device for body extremities. 4,215,679, Cl. 128-25.00B.
Ryan, Douglas G. Combination dewaxing process. 4,216,075, Cl. 208-35.000.
Rybicki, Edward B., to American Optical Corporation. Refractor optical system. 4,215,919, Cl. 351-29.000.
Rymer, Richard. Container-dumping machine. 4,215,968, Cl. 414-421.000.
Sabourin, Edward T.: *See—*
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Sacks, Paul S.: *See—*
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Sagae, Syoji: *See—*
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St. Louis, Raymond F. Encoding and decoding system. 4,216,500, Cl. 358-118.000.
Saito, Junichi: *See—*
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,216,228, Cl. 424-322.000.
Saito, Shinichi: *See—*
Sato, Masaaki; and Saito, Shinichi, 4,216,509, Cl. 360-94.000.
Saji, Ikutaro: *See—*
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Sakai, Tadao; Kawai, Masayoshi; and Shishido, Tadao, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. 4,216,284, Cl. 430-140.000.
Sakai, Yoshihiro: *See—*
Shiguma, Heijiro; Takahashi, Jun; Sakai, Yoshihiro; and Ohno, Akira, 4,215,558, Cl. 72-9.000.
Sakaida, Kaku, to Trio Kabushiki Kaisha. Protective circuitry for push-pull amplifiers. 4,216,437, Cl. 330-298.000.
Sakakibara, Naoji; and Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Automobile speed control system. 4,215,760, Cl. 180-176.000.
Sakamoto, Koji: *See—*
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, 4,215,930, Cl. 355-14.00D.
Sakamoto, Masayuki: *See—*
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Sakashita, Nobuyuki: *See—*
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Sala International AB: *See—*
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Salk Institute for Biological Studies, The: *See—*
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Salvatore, Leonard A., to Westinghouse Electric Corp. Low voltage vacuum switch with plural conic shields about the contacts. 4,216,361, Cl. 200-144.00B.
Samsonov, Grigory V., deceased: *See—*
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.
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Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.
Sanders Associates, Inc.: *See—*
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Poirier, Armand R.; Nussdorfer, Theodore J.; and Stewart, John H., 4,215,553, Cl. 60-650.000.
Sanders, James L., to Data Medical Associates, Inc. Precipitating reagent and method for isolation and determination of high density lipoproteins in human serum. 4,215,993, Cl. 23-230.00B.
Sandmeier, Arthur. Removable inner sole for footwear. 4,215,492, Cl. 36-44.000.
Sandoz Ltd.: *See—*
Keller-Juslen, Camilla; and King, Hamilton D., 4,216,206, Cl. 424-117.000.
Sandvik Aktiebolag: *See—*
Holma, Johan E.; Andersson, Ake A.; and Gavlefors, Nils L., 4,215,957, Cl. 407-114.000.
Sandvik, Inc.: *See—*
Fodor, William G., 4,215,528, Cl. 56-400.170.
Sandy, Charles A., to Du Pont de Nemours, E. I., and Company. Fuel compositions containing tetracoordinated cobalt compounds. 4,215,997, Cl. 44-68.000.
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, to Sumitomo Chemical Company, Limited. Photo-curable composite containing a screen material in a liquid resin. 4,216,287, Cl. 430-271.000.
Sansui Electric Co., Ltd.: *See—*
Takahashi, Shinobu, 4,216,517, Cl. 361-79.000.
Sanyo Electric Co., Ltd.: *See—*
Hosoya, Nobukazu, 4,216,493, Cl. 358-28.000.
Ikeda, Hironosuke; Hara, Mitsunori; Narukawa, Satoshi; and Maeda, Hiroji, 4,216,247, Cl. 427-115.000.
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Nishimura, Itsuro; and Ohgishi, Tsutomu, 4,216,451, Cl. 334-15.000.
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Sarantakis, Dimitrios, to American Home Products Corporation. Enkephalin analogues. 4,216,128, Cl. 260-8.000.
Saterdal, Edgar, to Aktiebolaget Svenska Flatfabriken. Axial fan. 4,215,973, Cl. 416-172.000.
Sato, Hisaaki; Shintani, Morio; Shinozaki, Takayoshi; Tsuchiya, Takuichi; and Asai, Toshio, to Nippon Electric Co., Ltd. Multi-cavity klystron device. 4,216,409, Cl. 315-5.460.
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-skid brake control device and associated method. 4,215,902, Cl. 303-119.000.
Sato, Masaaki; and Saito, Shinichi, to Olympus Optical Co., Ltd. Cassette player/recorder interchangeably handling cassettes of two sizes. 4,216,509, Cl. 360-94.000.
Sato, Tadashi; and Kubota, Atsushi, to Canon Kabushiki Kaisha. Image forming method and apparatus capable of controlling an electrostatic image formation area. 4,215,929, Cl. 355-7.000.
Sato, Takeshi, to Bridgestone Tire Company Limited. Safety pneumatic tires. 4,215,735, Cl. 152-354.00R.
Sato, Toshio; and Nagao, Shigeru, to Kao Soap Co., Ltd. Dyeing assistant for printing. 4,215,992, Cl. 8-445.000.
Satoh, Toshio: *See—*
Iwasaki, Norio; Satoh, Toshio; Ito, Hiroyuki; and Koike, Ikuya, 4,216,357, Cl. 179-100.10R.
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Savage, Milton. Lens holder. 4,215,890, Cl. 294-31.200.
Sawafuji Electric Co., Ltd.: *See—*
Omura, Morikazu; Kobayashi, Akio; and Okuda, Yukio, 4,216,385, Cl. 307-64.000.
Sawyer, James E.: *See—*
Gay, Derek J.; Trout, Robert G.; Chin, Manuel G. Y.; and Sawyer, James E., 4,215,843, Cl. 249-78.000.
Saylor, R. Glenn, to C. R. Bard, Inc. Membrane packaging machine. 4,215,524, Cl. 53-554.000.

Scarlett, John: *See—*
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Schack, Carl J.; and Christe, Karl O., to United States of America, Air Force. Synthesis of fluorocarbon esters. 4,216,338, Cl. 560-227.000.
Schaefer, Hans-Joachim. Fruit knife. 4,215,471, Cl. 30-147.000.
Schafer, Albert L., to Remcor Products Company. Ice hopper having a plurality of shelves and a ramp. 4,215,803, Cl. 222-240.000.
Schafer, Arnold, to IBAG-Vertrieb GmbH. Mechanism for mounting the shell of the breaker in cone crushers. 4,215,826, Cl. 241-207.000.
Schams, Ronald T.; and Brown, James N., to Minnesota Mining and Manufacturing Company. Strip material for forming flexible backed fasteners. 4,216,257, Cl. 428-93.000.
Schatz, Anton: *See—*
Feneberg, Paul; Konigl, Georg; Kirchhof, Gunther; and Schatz, Anton, 4,215,933, Cl. 355-50.000.
Schauer, Walter, to Pierburg GmbH & Co. KG, Firma. Carburetor for combustion engines. 4,216,175, Cl. 261-39.00D.
Scheinpflug, Gunter: *See—*
Gottsmann, Helmut; and Scheinpflug, Gunter, 4,215,944, Cl. 400-314.000.
Scheurecker, Werner; and Ippisch, Friedrich, to Voest-Alpine Aktiengesellschaft. Starter bar to be used in continuous casting plants. 4,215,740, Cl. 164-446.000.
Schindler, Johannes G.; and Riemann, Werner, to Dr. E. Fresenius Chemisch Pharmazeutische Industrie KG Apparatebau KG. Ion sensitive electrode and cells for use therewith. 4,216,068, Cl. 204-195.00R.
Schmall, Karl-Heinz; and Sendor, Piotr, to Schmall, Karl-Heinz. Apparatus and method for controlling game playing time. 4,215,856, Cl. 272-3.000.
Schmalz, Axel. Method of treating television picture signals and wideband data signals by modulating the color carrier signal. 4,216,492, Cl. 358-16.000.
Schmid, Rolf: *See—*
Gutekunst, Ferdinand; Lohse, Friedrich; and Schmid, Rolf, 4,216,304, Cl. 528-94.000.
Schmidt, Paul J.: *See—*
Otis, Harold R.; Blake, Charles E.; and Schmidt, Paul J., 4,216,263, Cl. 428-383.000.
Schmidt, Werner; and Watzek, Gerhard, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Cabin for trucks with trailer-fixtures. 4,215,899, Cl. 296-190.000.
Schmit, Paul F., to Minnesota Mining and Manufacturing Company. Heat sealing platen. 4,216,050, Cl. 156-494.000.
Schmitt, Frederick L.: *See—*
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.
Schmitz, Gunter: *See—*
Ackermann, Wilhelm; Langlitz, Karlheinz; and Schmitz, Gunter, 4,215,852, Cl. 266-89.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Process for making N-(N'-methylenepyrrolidonyl)-2-substituted anilines. 4,216,152, Cl. 260-326.50S.
Schneider, Martin V.: *See—*
Linke, Richard A.; and Schneider, Martin V., 4,216,450, Cl. 333-248.000.
Schoelkopf, James E., to J. I. Case Company. Articulation lock. 4,215,874, Cl. 280-474.000.
Schoerner, Roger J.: *See—*
Chia, E. Henry; and Schoerner, Roger J., 4,216,031, Cl. 148-2.000.
Scholtholt, Josef: *See—*
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; and Schraven, Eckhard, 4,216,314, Cl. 544-123.000.
Schrag, Thomas G.; Hill, Amos G.; and Lohrentz, Howard R., to Hesston Corporation. Bale-accumulating trailer. 4,215,964, Cl. 414-111.000.
Schraven, Eckhard: *See—*
Raabe, Thomas; Grawinger, Otto; Scholtholt, Josef; and Schraven, Eckhard, 4,216,314, Cl. 544-123.000.
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, to Bayer Aktiengesellschaft. Process for the preparation of carbonic acid bis-diphenol esters of polyester-diols and their use for the preparation of high-molecular segmented polyester/polycarbonates which can be processed as thermoplastics. 4,216,298, Cl. 525-439.000.
Schulmeister, Robert: *See—*
Dinger, Hans; and Schulmeister, Robert, 4,215,550, Cl. 60-606.000.
Schulte, Klaus: *See—*
Ebeling, Wilfried; Onnenberg, Volker; Gonzalez-Dorner, Alberto C.; Lehmann, Bernd; Rabe, Hansjurgen; and Schulte, Klaus, 4,216,181, Cl. 264-51.000.
Schwaiger, Josef. Baby feeding bottle. 4,215,785, Cl. 215-11.00C.
Schwope, Arthur D.: *See—*
Gregory, John B.; Schwope, Arthur D.; and Wise, Donald L., 4,215,686, Cl. 128-156.000.
Scott, Daniel G.; and Mong, William K., to Westinghouse Air Brake Company. Hose coupling. 4,215,881, Cl. 285-68.000.
Scott Paper Company: *See—*
Grant, Clyde P.; and Lowe, Richard M., 4,215,927, Cl. 354-317.000.
Scott, Paul R., to Shell Oil Company. System for removing fluid and debris from pipelines. 4,216,026, Cl. 134-4.000.
Sears, Stephan B.: *See—*
Kyser, Edmond L.; and Sears, Stephan B., 4,216,483, Cl. 346-140.00R.
Secor, Henry V., to Philip Morris Incorporated. Method of producing γ-amino alcohols. 4,216,329, Cl. 546-334.000.
Secretin, Marie-Christine: *See—*
Mueller, Hans R.; and Secretin, Marie-Christine, 4,216,236, Cl. 426-72.000.
Seely, Charles R. Method and apparatus for copy-fitting. 4,216,373, Cl. 235-88.00R.
Seemann, Ronald W.; and Bradshaw, Thomas I., to Minnesota Mining and Manufacturing Company. Reinforcing or sealing solid structures or for anchoring bolts therein and cartridges for use in such method. 4,216,180, Cl. 264-35.000.
Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi; and Ishida, Hiroaki, 4,215,923, Cl. 354-30.000.
Seki, Fumio; and Oikado, Taizo. Internal mirror type gas laser tube. 4,216,438, Cl. 331-94.50D.
Seki, Masayuki, to Nissin Kogyo Kabushiki Kaisha. Caliper supporting device in a disc brake for vehicles. 4,215,768, Cl. 188-73.300.
Sekiguchi, Takeshi: *See—*
Ohshima, Shigeru; and Sekiguchi, Takeshi, 4,216,494, Cl. 358-55.000.
Sekizawa, Yasuharu: *See—*
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Selas Corporation of America: *See—*
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Sele, Alex: *See—*
Haas, Georges; Rossi, Alberto; Jaeggi, Knut A.; and Sele, Alex, 4,216,155, Cl. 260-345.200.
Sels, Francis J.; Kokelenberg, Hendrik E.; and van Veelen, George F., to AGFA-GEVAERT N.V. Hardening solution for proteinaceous materials. 4,216,108, Cl. 252-182.000.
Selwitz, Charles M.: *See—*
Onopchenko, Anatoli; Sabourin, Edward T.; and Selwitz, Charles M., 4,216,341, Cl. 568-705.000.
Sendor, Piotr: *See—*
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Seufert, Wilhelm; Gnadig, Gerhard; Przybylla, Fritz; Christen, Wolfgang; and Grimminger, Albert, to Werner & Pfleiderer. Kneading disc for a screw extruder. 4,215,942, Cl. 366-343.000.
Seyfarth, Gunther: *See—*
Emmel, Ludwig; Rochling, Hans; and Seyfarth, Gunther, 4,216,213, Cl. 424-219.000.
Shabtai, Joseph: *See—*
Lahar, Noam; and Shabtai, Joseph, 4,216,188, Cl. 423-118.000.
Shaffstall, Robert M.; Burton, Russell R.; and Jaggars, Jamy L., to United States of America, Air Force. Ready pressure attachment for existing anti-G valves. 4,215,712, Cl. 137-39.000.
Shakhova, Galina I.: *See—*
Juferov, Anatoly M.; Shakhova, Galina I.; and Nesterova, Olga M., 4,216,088, Cl. 210-59.000.
Shalhoob, William N.; Chenchick, Carl W.; and Kaspaul, Alfred F., to Hydromagnetics, Inc. Coaxial hydromagnetic device for hydraulic circuits containing calcium and magnesium ions. 4,216,092, Cl. 210-222.000.
Shanel, Kathleen A. Holder for rubber dental dam. 4,215,477, Cl. 433-136.000.
Sharp, Gordon. Visual display device. 4,215,500, Cl. 40-409.000.
Shaw, Frank D. Body or limb encircling therapeutic device. 4,215,687, Cl. 128-169.000.
Shaw, Richard J.: *See—*
Burns, Fredrick B.; and Shaw, Richard J., 4,215,448, Cl. 15-210.00R.
Sheldahl, Inc.: *See—*
Huschle, Robert J.; and Roberts, Sidney J., 4,215,516, Cl. 51-399.000.
Shell, Michael D.: *See—*
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Shell Oil Company: *See—*
Griffin, Leonard H.; Hunt, Richard H.; and Telfer, Alexander, 4,216,376, Cl. 250-357.000.
Himes, Glenn R.; and Zweig, Judith E., 4,216,131, Cl. 260-33.6AQ.
Olson, Don C., 4,216,069, Cl. 204-195.00R.
Scott, Paul R., 4,216,026, Cl. 134-4.000.
Verschuur, Eke, 4,216,082, Cl. 209-10.000.
Zweig, Judith E.; and Himes, Glenn R., 4,216,132, Cl. 260-33.6AQ.
Shepherd, David: *See—*
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Shepherd, Freddie A.: *See—*
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Shepherd, Robert G., to American Cyanamid Company. 5-[4-Monoalkylaminophenyl]tetrazoles. 4,216,330, Cl. 548-254.000.
Sheppard, Clyde H.: *See—*
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Sherry, Howard S.: *See—*
Campbell, Thomas C.; Hertzenberg, Elliot P.; and Sherry, Howard S., 4,216,125, Cl. 252-527.000.
Sherwood Medical Industries Inc.: *See—*
Crouther, Ronald; Li, Vincent H.; and Dodge, Larry H., 4,215,700, Cl. 128-763.000.
Shibata, Akira; and Watatani, Yoshizumi, to Hitachi, Ltd. Integrated circuit for frequency conversion. 4,216,431, Cl. 455-333.000.

Shibazaki, Hiroshi: *See*—
Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, 4,215,862, Cl. 273-350.000.
Shiguma, Heijiro; Takahashi, Jun; Sakai, Yoshihiro; and Ohno, Akira, to NHK Spring Co., Ltd. Process of manufacturing a taper leaf spring and its device. 4,215,558, Cl. 72-9.000.
Shimada, Katsumi: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimada, Katsumi, 4,216,533, Cl. 365-230.000.
Shimada, Satoshi: *See*—
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Shimizu, Akira: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,215,931, Cl. 355-14.00R.
Shimizu, Takanori: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, 4,216,020, Cl. 106-56.000.
Shimizu, Takeshi, to Kabushikikaisha Anoa. Line connecting table game set. 4,215,866, Cl. 273-275.000.
Shimoji, Toshikuni: *See*—
Kunii, Yutaka; Shimoji, Toshikuni; and Jingu, Masaharu, 4,215,585, Cl. 73-633.000.
Shimonou, Shigeru; and Inada, Hiroshi, to Nippon Electric Co., Ltd. Position control system comprising a digital algebraic adder circuit. 4,216,415, Cl. 318-600.000.
Shinn, Stuart: *See*—
Littlefield, Reginald D.; and Shinn, Stuart, 4,215,766, Cl. 182-46.000.
Shinoda, Noboru: *See*—
Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, 4,216,020, Cl. 106-56.000.
Shinohara, Yoshinori: *See*—
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Shinozaki, Takayoshi: *See*—
Sato, Hisaaki; Shintani, Morio; Shinozaki, Takayoshi; Tsuchiya, Takuichi; and Asai, Toshio, 4,216,409, Cl. 315-5.460.
Shintani, Morio: *See*—
Sato, Hisaaki; Shintani, Morio; Shinozaki, Takayoshi; Tsuchiya, Takuichi; and Asai, Toshio, 4,216,409, Cl. 315-5.460.
Shionogi & Co., Ltd.: *See*—
Tanida, Hiroshi; and Irie, Tadashi, 4,216,231, Cl. 424-330.000.
Shipley, Gerald A.: *See*—
Waterworth, Norman; Whateley, Eric A.; Shipley, Gerald A.; and McKnight, John, 4,215,755, Cl. 180-6.440.
Shirahata, Kunikatsu: *See*—
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, to Ajinomoto Co., Inc. Process for preparing fibrous protein food products. 4,216,240, Cl. 426-516.000.
Shiratsuchi, Masami; Kawamura, Kiyoshi; Kunieda, Hisashi; Machida, Naoki; Akashi, Toshihiro; and Nagakura, Masahiko, to Kowa Company, Ltd. Methylmethioninesulfonium compounds, process for their preparation, and pharmaceutical compositions containing them. 4,216,225, Cl. 424-287.000.
Shirey, Frank W., to Westinghouse Air Brake Company. Parking brake device. 4,215,767, Cl. 188-265.000.
Shirikov, Alexandr A.: *See*—
Popov, Alexandr D.; Solomin, Vladimir A.; Khantimirov, Sergei S.; and Shirikov, Alexandr A., 4,216,397, Cl. 310-13.000.
Shishido, Tadao: *See*—
Sakai, Tadao; Kawai, Masayoshi; and Shishido, Tadao, 4,216,284, Cl. 430-140.000.
Shivashankar, Srinivasarao A.: *See*—
Griffing, Bruce F.; and Shivashankar, Srinivasarao A., 4,215,577, Cl. 73-362.0SC.
Shoji, Isao: *See*—
Watanabe, Noritoshi; Yamamoto, Riyozo; Shoji, Isao; and Yagi, Hisanori, 4,216,055, Cl. 162-117.000.
Shomura, Takashi: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Shono, Kinji; and Suzuki, Kunihiko, to Nissan Motor Company, Limited. Transfer case for automotive vehicles. 4,215,593, Cl. 74-665.00D.
Shrekenhamer, Abraham: *See*—
Goldfischer, Lester I.; Stavis, Gus; and Shrekenhamer, Abraham, 4,216,473, Cl. 343-8.000.
Shriver, Joe E.; and Lindblom, Curtis H., to Sperry Rand Corporation. Multi-row crop header with feed assist roller. 4,215,527, Cl. 56-98.000.
Shroot, Braham: *See*—
Ross, Barry C.; and Shroot, Braham, 4,216,215, Cl. 424-246.000.
Shuman, Richard F.; and Tull, Roger J., to Merck & Co., Inc. Process for preparing adenine. 4,216,317, Cl. 544-277.000.
Sibborn, Michael J.: *See*—
Hilliard, Lonnie G.; and Sibborn, Michael J., 4,216,047, Cl. 156-285.000.
Sidlinger, Bruce C. Demountable assembly for attaching a camper body and load carrier to a pickup body. 4,215,894, Cl. 296-3.000.
Sie, Swan L., to Eurometaal N.V. Exercise projectile, more especially of the discarding sabot type. 4,215,632, Cl. 102-92.700.
Sieber, Werner: *See*—
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Siemak, John B.: *See*—
Long, Ray S.; and Siemak, John B., 4,216,087, Cl. 210-58.000.
Siemens Aktiengesellschaft: *See*—
Franke, Kurt, 4,216,382, Cl. 250-408.000.
Graul, Juergen; and Mueller, Helmut, 4,216,030, Cl. 148-1.500.
Kullmann, Dieter, 4,216,398, Cl. 310-53.000.
Siemens-Allis, Inc.: *See*—
Bartheld, Robert G.; and Diamant, Paul, 4,216,399, Cl. 310-91.000.
Siemssen, Ernst A., to Selas Corporation of America. Method for making furnace lining. 4,216,183, Cl. 264-80.000.
SIG Schweizerische Industrie-Gesellschaft: *See*—
Heinzer, Hans; and Muller, Werner, 4,215,520, Cl. 53-173.000.
Sigmon, James W. Rotary flow regulating valve and method. 4,215,722, Cl. 137-625.300.
Sigri Elektrographit Gesellschaft mit beschrankter Haftung: *See*—
Hirschvogel, Alfred; and Freundlinger, Ernst, 4,216,266, Cl. 428-408.000.
Silonics, Inc.: *See*—
Kyser, Edmond L.; and Sears, Stephan B., 4,216,483, Cl. 346-140.00R.
Silvestri, Giovanni J., to United States of America, Navy. Rotary expander engine. 4,215,533, Cl. 60-39.630.
Silvestri, Giovanni J., to United States of America, Navy. Cooling system for an expander engine. 4,215,534, Cl. 60-39.630.
Simco Company, Inc., The: *See*—
Simons, Dolph, 4,216,518, Cl. 361-213.000.
Simizu, Chiyuki, to Toshiba Silicone Co., Ltd. Room temperature vulcanizable polyorganosiloxane composition. 4,216,140, Cl. 260-45.75R.
Simon, Donald R.: *See*—
Dobrjanskyj, Leo; and Simon, Donald R., 4,215,641, Cl. 112-278.000.
Simon, Sydney S. Series sliding contact switch. 4,216,362, Cl. 200-153.00S.
Simone, Andre A., to Lummus Company, The. Dual delayed coking of coal liquefaction product. 4,216,074, Cl. 208-8.0LE.
Simons, Dolph, to Simco Company, Inc., The. Capacitively coupled static eliminator with high voltage shield. 4,216,518, Cl. 361-213.000.
Simons, Harold M., to Billings Energy Corporation. Self-regenerating method and system of removing oxygen and water impurities from hydrogen gas. 4,216,198, Cl. 423-648.00R.
Singer Company, The: *See*—
Coughenour, Donald J., 4,215,640, Cl. 112-264.100.
Dobrjanskyj, Leo; and Simon, Donald R., 4,215,641, Cl. 112-278.000.
Goldfischer, Lester I.; Stavis, Gus; and Shrekenhamer, Abraham, 4,216,473, Cl. 343-8.000.
Johnson, Ralph E., 4,215,638, Cl. 112-221.000.
Johnson, Ralph E., 4,215,639, Cl. 112-242.000.
Sisme Societa Italiana Statori Motori Electric S.p.A.: *See*—
DeCamilli, Franco, 4,215,561, Cl. 72-473.000.
Skillicorn, Douglas E., to B. F. Goodrich Company, The. Liquid vinylidene-terminated polymers. 4,216,302, Cl. 526-312.000.
Skinner, Harry W.; and Burdick, Alan D., to Press Seal Gasket Corporation. Gasket apparatus and method. 4,215,868, Cl. 277-1.000.
Skoldinov, Alexandr P.; Likhosherstov, Arkady M.; Peresada, Vitaly P.; and Chizhov, Konstantin O., to Nauchno-Issledovatelsky Institut Farmakologii. 3,4-Dihydropyrrolo-[1,2-a]-pyrazine and method of preparing same. 4,216,321, Cl. 544-349.000.
Slagel, Gary A.; and Bonfield, Peter L., to Texas Instruments Incorporated. Interchangeable module for integrated circuits. 4,216,522, Cl. 361-392.000.
Smarook, Walter H.: *See*—
Lundell, Edwin O.; and Smarook, Walter H., 4,216,254, Cl. 428-35.000.
Smialek, Raymond J.: *See*—
Lewis, Harvie H.; Morganson, Neal E.; and Smialek, Raymond J., 4,216,315, Cl. 544-192.000.
Smid, Jacob K., to Chem-Y, Fabriek van Chemische Produkten, B.V. Stable concentrated solution of glycidyltrimethylammonium chloride and process for preparing stable concentrated solutions of glycidyltrimethylammonium chloride. 4,216,156, Cl. 260-348.380.
Smith, Dennis B. Roll of disposable aprons. 4,215,432, Cl. 2-48.000.
Smith, Irving E., to Florida East Coast Railway Company. Machine for engaging and rotating concrete crosstie bolts. 4,215,636, Cl. 104-17.00R.
Smith Kline & French Laboratories Limited: *See*—
Brown, Thomas H.; Durant, Graham J.; and Ganellin, Charon R., 4,216,318, Cl. 544-310.000.
Smith, Richard J., Jr.; and Bellino, Ralph R., to W. R. Grace & Co. Electric water pump. 4,215,658, Cl. 123-41.440.
Smith, Steven R.: *See*—
Krystek, Michael S.; Hurley, George L., III; Smith, Steven R.; and Rice, Stephen E., 4,216,529, Cl. 364-510.000.
Smith, Walton J. Potassium-supplement composition. 4,216,237, Cl. 426-74.000.
Societe Anonyme Automobiles Citroen: *See*—
Horblin, Michel Y., 4,216,520, Cl. 361-239.000.

Societe Anonyme des Etablissements Adrien De Backer: *See*—
Plas, Jean J., 4,216,413, Cl. 315-323.000.
Societe Anonyme des Imprimerie et Papeterie de l'Est.: *See*—
Callet, Robert; and Jeantet, Henri, 4,215,725, Cl. 137-855.000.
S.A. dite Compagnie Generale de Chauffe: *See*—
Delaporte, Jean-Charlemagne, 4,215,817, Cl. 237-2.00B.
Societe Chauvin Arnoux: *See*—
Arnoux, Daniel; Koehler, Gerard; Michel, Bernard; Genter, Claude; Aguettaz, Jean; and Berthelot, Alain, 4,216,452, Cl. 335-128.000.
Societe d'Assistance Technique pour Produits Nestle S.A.: *See*—
Dasek, Jaroslav; Shepherd, David; and Wood, Robert D., 4,216,235, Cl. 426-46.000.
Mueller, Hans R.; and Secretin, Marie-Christine, 4,216,236, Cl. 426-72.000.
Societe Nationale Elf Aquitaine (Production): *See*—
Debost, Robert, 4,216,070, Cl. 204-197.000.
Societe Suisse pour l'Industrie Horlogere (SSIH) Management Services, S.A.: *See*—
Engdahl, Jean, 4,216,402, Cl. 310-320.000.
Sogi, Toshiyuki: *See*—
Motomura, Kenichi; Yahagi, Mitsuhisa; and Sogi, Toshiyuki, 4,215,737, Cl. 152-362.00R.
Solartrap, Inc.: *See*—
Bowles, Vernon O., 4,215,744, Cl. 165-158.000.
Soliberger, Roger W.; and Webb, Walter J. Portable electric fastener driving apparatus. 4,215,808, Cl. 227-146.000.
Solly, Barry: *See*—
Gemmel, Goran; Aslund, Christer; and Solly, Barry, 4,216,013, Cl. 75-125.000.
Solomin, Vladimir A.: *See*—
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Solomko, Nikolai N.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Solum, Dallas H., to Envirotech Corporation. Sector body for rotary disc dewatering apparatus. 4,216,094, Cl. 210-331.000.
Sommer, Klaus; and Weber, Hermann, to Benckiser-Knapsack GmbH. N-Sulfo alkane amino alkane phosphoric acids and their alkali metal salts, and a process of producing same. 4,216,163, Cl. 260-502.500.
Soula, Gerard, to Rhone-Poulenc Industries. Tris(5-amino-3-thia-pentyl)amine and method of preparing same. 4,216,170, Cl. 260-583.0EE.
Soula, Gerard; and Le Ludec, Joel, to Rhone-Poulenc Industries. Novel compositions having a base of aminoalkoxy amines. 4,216,171, Cl. 260-584.00B.
Southwire Company: *See*—
Chia, E. Henry; and Schoerner, Roger J., 4,216,031, Cl. 148-2.000.
Sparks, Alton N.: *See*—
Klun, Jerome A.; Plimmer, Jack R.; Sparks, Alton N.; and Leonhardt, Barbara B., 4,216,202, Cl. 424-84.000.
Sparling, James D. Ski servicing and repairing tool. 4,215,947, Cl. 401-125.000.
Speicher, John M., to General Dynamics Corporation. Zero slip four-point contact thrust bearing. 4,215,906, Cl. 308-235.000.
Sperry Rand Corporation: *See*—
Shriver, Joe E.; and Lindblom, Curtis H., 4,215,527, Cl. 56-98.000.
Spickenreither, Josef: *See*—
Laar, Erwin; Sieber, Werner; and Spickenreither, Josef, 4,215,719, Cl. 137-563.000.
Spiess, Fred N., to United States of America, Navy. Apparatus and method for supporting oceanographic equipment at selected ocean depths. 4,215,572, Cl. 73-170.00A.
Spiteri, Joseph. Truck marker light. 4,216,525, Cl. 362-80.000.
Spitz, Eugene B.; Brenz, Richard E.; and Hansford, Charles C., to Medical Devices, Inc. Fluid draining system. 4,215,695, Cl. 128-350.00V.
Sprague Electric Company: *See*—
Genesi, Robert C., 4,216,379, Cl. 250-214.00P.
SRI International: *See*—
Evans, William E.; and Viezee, William, 4,216,498, Cl. 358-93.000.
Stambaugh, Gary E., to Caterpillar Tractor Co. Adjustable air intake assembly and method. 4,215,665, Cl. 123-198.00E.
Stamets, Stanley L.; Winkless, Robert A.; Hernandez, Rafael J.; Merle, Joseph J.; and Payne, Robert D., to Continental Group, Inc., The. Electrostatic air/powder stripe applicator. 4,215,648, Cl. 118-622.000.
Stamicarbon, B.V.: *See*—
Goettsch, Reijer; and Jetten, Arnold G. M., 4,216,151, Cl. 260-326.5FN.
Standard Keil Hardware Manufacturing Co.: *See*—
Loikitz, Frank F., 4,215,449, Cl. 16-50.000.
Standard-Messo-Duisburg Gesellschaft fur Chemietechnik mit beschrankter Haftung & Co.: *See*—
Holtermann, Heinz; and Luven, Arno, 4,216,347, Cl. 13-9.00R.
Standard Oil Company (Indiana): *See*—
Lautzenhiser, Theodore V., 4,215,578, Cl. 73-382.00G.
Stanek, Oldrich: *See*—
Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, 4,215,782, Cl. 206-525.000.
Stanley, Richard W.: *See*—
Kelly, Calvin E.; and Stanley, Richard W., 4,216,062, Cl. 202-248.000.
Stanley Works, The: *See*—
Elmore, James; and Ziel, Richard E., 4,215,473, Cl. 30-172.000.
Rathbun, Richard H.; and Hildebrandt, William J., 4,215,828, Cl. 242-84.800.
Stanwick, Tad. Method of generating rotary power in a deepsea environment. 4,215,544, Cl. 60-398.000.
Stapp, Paul R., to Phillips Petroleum Company. Catalyst system comprising elemental sulfur or a sulfur halide for conversion of dienes or monoolefins to diesters. 4,216,119, Cl. 252-429.00R.
Staudt, John J., III: *See*—
Carstensen, Kenneth J.; and Staudt, John J., III, 4,215,602, Cl. 81-57.180.
Stauffer Chemical Company: *See*—
Baker, Don R.; and Hyzak, Daniel L., 4,216,238, Cl. 426-321.000.
Walker, Francis H., 4,216,222, Cl. 424-278.000.
Staveley Machine Tools Limited: *See*—
Andrews, Paul R., 4,215,903, Cl. 308-1.00R.
Stavis, Gus: *See*—
Goldfischer, Lester I.; Stavis, Gus; and Shrekenhamer, Abraham, 4,216,473, Cl. 343-8.000.
Stayner, Vance A. Fire retardant resin compositions and articles formed thereof. 4,216,136, Cl. 260-40.00R.
Steckel, Thomas F., to Lubrizol Corporation, The. Bridged phenol metal salt/halo carboxylic acid condensate additives for lubricants. 4,216,099, Cl. 252-33.600.
Steckler, Steven A.: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,216,396, Cl. 307-353.000.
Stefanski, Anthony T.: *See*—
Carson, John R.; Carmosin, Richard J.; and Stefanski, Anthony T., 4,216,150, Cl. 260-326.200.
Steffen, Klaus D.; and Englaender, Fritz, to Dynamit Nobel Aktiengesellschaft. Method of preparing phthalide. 4,216,153, Cl. 260-343.30R.
Steiger, Alfred, to Heberlein Textildruck AG. Process for producing cloque or undulating effects on the surfaces of textile fabrics. 4,215,991, Cl. 8-115.000.
Stein, Eckehard, to Hoechst Aktiengesellschaft. Process for conducting ammonia in a developing apparatus used for developing diazotype copying material. 4,215,926, Cl. 354-300.000.
Stein, Karl N. Method for treatment of skin burns in mammals. 4,216,233, Cl. 424-350.000.
Steiner, Russel I., to Crompton & Knowles Corporation. 4-Alkoxy-5-(N,N-dialkylamino)-2-[(2,5-dichlorophenyl)azo]acylanilides. 4,216,248, Cl. 427-148.000.
Steinwart, Johannes; Lummerzheim, Konrad; Bauder, Armin; and Wilmers, Gottlieb, to Audi NSU Auto Union Aktiengesellschaft. Internal combustion engine having an afterburning device. 4,215,538, Cl. 60-276.000.
Stenzel, Reiner L.; and Daley, William F., to TRW Inc. Large, indirectly heated, oxide-coated cathode for producing uniform plasmas. 4,216,405, Cl. 313-310.000.
Sterling Drug Inc.: *See*—
Zenitz, Bernard L., 4,216,326, Cl. 546-226.000.
Stevenson, William D., to Brown Brothers & Company, Ltd. Tensioner device for offshore oil production and exploration platforms. 4,215,950, Cl. 405-195.000.
Stewart, John H.: *See*—
Poirier, Armand R.; Nussdorfer, Theodore J.; and Stewart, John H., 4,215,553, Cl. 60-650.000.
Stewart, Roger G., to RCA Corporation. Level shift circuit. 4,216,390, Cl. 307-264.000.
Stieff, Lorin R. Field method for detecting deposits containing uranium and thorium. 4,216,380, Cl. 250-255.000.
Stillman, Nathan, to Champion International Corporation. Balanced oriented flexible packaging composite. 4,216,268, Cl. 428-424.800.
Stofan, Joseph M.: *See*—
Esler, Thomas C., 4,215,776, Cl. 198-823.000.
Stogryn, Eugene L.: *See*—
Klemann, Lawrence P.; and Stogryn, Eugene L., 4,216,191, Cl. 423-364.000.
Stokbroekx, Raymond: *See*—
Van der Aa, Marcel; and Stokbroekx, Raymond, 4,216,217, Cl. 424-263.000.
Stournas, Stamoulis, to Mobil Oil Corporation. Waterflooding employing amphoteric surfactants. 4,216,097, Cl. 252-8.55D.
Strahan, Virgil H.: *See*—
Quick, William H.; James, Kenneth A.; and Strahan, Virgil H., 4,215,576, Cl. 73-356.000.
Strahle, Fritz: *See*—
Muchel, Franz; and Strahle, Fritz, 4,215,914, Cl. 350-175.0GN.
Stratton, Boyd L.: *See*—
Boussina, Touraj; Crosno, Philip M.; Herzog, William F.; Kasprzak, Vincent D.; and Stratton, Boyd L., 4,216,504, Cl. 358-8.000.
Strickland, Ola D. Suture holding case. 4,215,777, Cl. 206-63.300.
Structural Instrumentation, Inc.: *See*—
Hagedorn, Thomas H.; and DeForrest, Allen L., 4,215,754, Cl. 177-137.000.
Stuhmer, Werner: *See*—
Milkowski, Wolfgang; Budden, Renke; Funke, Siegfried; Huschens, Rolf; Liepmann, Hans-Gunther; Stuhmer, Werner; and Zeugner, Horst, 4,216,167, Cl. 260-558.00D.
Sturgeon, Leonard A., to Bralorne Resources Limited. Engine air cut-off device. 4,215,845, Cl. 251-63.000.

Sturgis, Donald P.: *See—*
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., 4,216,375, Cl. 235-382.000.
Stutsman, Richard R.: *See—*
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,215,800, Cl. 221-129.000.
Sudmersen, Udo: *See—*
Fritz, Ulrich; Kamm, Willibald; Kipp, Thorwald; and Sudmersen, Udo, 4,215,825, Cl. 241-34.000.
Sudo, Tsuneta: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimada, Katsumi, 4,216,533, Cl. 365-230.000.
Sudweeks, Walter B.; and Jessop, Harvey A., to IRECO Chemicals. Emulsion blasting composition. 4,216,040, Cl. 149-21.000.
Sugawara, Hiroyuki: *See—*
Tokuyama, Shunji; and Sugawara, Hiroyuki, 4,216,513, Cl. 361-13.000.
Sugawara, Yoshitaka: *See—*
Konishi, Nobutake; Yokota, Takeshi; Sugawara, Yoshitaka; Yatsuo, Tsutomu; and Okamura, Masahiro, 4,216,487, Cl. 357-39.000.
Sugimoto, Masahiro: *See—*
Iida, Takao; Shirahata, Kunikatsu; Matsubara, Isao; Sugimoto, Masahiro; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,216,308, Cl. 536-17.00R.
Sugimoto, Tetsuya: *See—*
Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, 4,216,020, Cl. 106-56.000.
Sulewsky, James E.: *See—*
Cunningham, Donald R.; and Sulewsky, James E., 4,215,762, Cl. 181-201.000.
Suling, Carlhans: *See—*
Schreckenberg, Manfred; Freitag, Dieter; Lindner, Christian; Suling, Carlhans; Bartl, Herbert; and Konig, Klaus, 4,216,298, Cl. 525-439.000.
Sulliva, Michael: *See—*
Terman, David S.; Sulliva, Michael; and Cullis, Herbert M., 4,215,688, Cl. 128-214.00R.
Sullivan, Richard W., to United States of America, Energy. Method of making crack-free zirconium hydride. 4,216,110, Cl. 252-301.10R.
Sulzbach, Reinhard A., to Hoechst Aktiengesellschaft. Aftertreatment of thermally pretreated tetrafluoroethylene polymers and the polymer powders obtained. 4,216,265, Cl. 428-402.000.
Sumitomo Chemical Company, Limited: *See—*
Agui, Hideo; Saji, Ikutaro; and Nakashita, Mitsuo, 4,216,333, Cl. 548-345.000.
Sano, Takezo; Inoue, Haruo; and Furuta, Akihiro, 4,216,287, Cl. 430-271.000.
Sumitomo Durez Company, Ltd.: *See—*
Kikuga, Toyoji; and Hirai, Koji, 4,216,299, Cl. 525-491.000.
Kikuga, Toyoji; and Hirai, Koji, 4,216,300, Cl. 525-491.000.
Sumitomo Electric Industries, Ltd.: *See—*
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,009, Cl. 75-0.5AB.
Miyake, Masaya; Nakano, Minol; Yamamoto, Takaharu; and Hara, Akio, 4,216,034, Cl. 148-20.300.
Sumitomo, Yasusuke: *See—*
Matsuda, Takashi; Niwa, Kazuo; and Sumitomo, Yasusuke, 4,216,491, Cl. 357-49.000.
Summers, Thomas W.; and Kohnhorst, Earl E., to Brown & Williamson Tobacco Corporation. Method and apparatus for separating sand from botanical fines. 4,216,080, Cl. 209-469.000.
Sun, Robert C.: *See—*
Clemens, James T.; Mehta, Dinesh A.; Nelson, James T.; Pearce, Charles W.; and Sun, Robert C., 4,216,489, Cl. 357-41.000.
Sundin, Harry G. I., to AB Karlshamns Plastindustri. Curler. 4,215,710, Cl. 132-40.000.
Sunergy Corporation: *See—*
Reale, Salvatore, 4,215,670, Cl. 126-164.000.
Supreme Aluminum Industries, Ltd.: *See—*
Littlefield, Reginald D.; and Shinn, Stuart, 4,215,766, Cl. 182-46.000.
Suzuki, Kunihiko: *See—*
Shono, Kinji; and Suzuki, Kunihiko, 4,215,593, Cl. 74-665.00D.
Suzuki, Shouichi: *See—*
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Suzuki, Takashi: *See—*
Hasegawa, Mitsuo; Shinohara, Yoshinori; Suzuki, Takashi; and Yokota, Akira, 4,216,377, Cl. 250-574.000.
Suzuki, Yasuo; Tamura, Akira; and Matsumoto, Kenji, to Bridgestone Tire Company Limited. Pneumatic tire having a durable tread of wide width. 4,215,734, Cl. 152-209.0WT.
Swaine, Derwent, to Oxoid Limited. Disc dispenser. 4,215,799, Cl. 221-93.000.
Swaringen, Roy A., Jr.: *See—*
Yeowell, David A.; and Swaringen, Roy A., Jr., 4,216,319, Cl. 544-325.000.
Swiss Aluminium Ltd.: *See—*
Ames, Adolf; Theler, Jean-Jacques; and Wagner, Alfred, 4,215,560, Cl. 72-258.000.
Festag, Werner; Muller, Hans-Ueli; Stanek, Oldrich; and Bahler, Peter, 4,215,782, Cl. 206-525.000.
Pirner, Miroslav; Zoller, Heinrich; and Bichsel, Heinz, 4,216,016, Cl. 75-141.000.
Sycor, Inc.: *See—*
Vidwans, Mohan P., 4,216,512, Cl. 360-133.000.
Sylvester, Gerd; Beck, Manfred; Witte, Josef; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Catalyst, its preparation and use in the polymerization of butadiene. 4,216,121, Cl. 252-431.00C.
Syrov, Anatoly A.: *See—*
Ivanchev, Sergei S.; Enikolopov, Nikolai S.; Polozov, Boris V.; Syrov, Anatoly A.; Primachenko, Oleg N.; and Polyakov, Zorislav N., 4,216,024, Cl. 106-308.00Q.
Szabo, Francis S.; and Pick, George G., to AM International, Inc. Method for projecting characters at a selected point size in a photocomposition machine. 4,215,922, Cl. 354-5.000.
Szewczyk, Richard S., to USM Corporation. Position of a workpiece in a roll turning lathe. 4,215,482, Cl. 33-181.00R.
Szolnok Megyei Tegla- es Cserepipari Vallalat: *See—*
Onodi, Zoltan; Mikola, Sandor; Farkas, Ferenc; and Kovacs, Istvan, 4,215,487, Cl. 34-167.000.
Szott, Ryszard; and Machnowski, Ryszard, to Osrodek Badawczo-Rozwojowy Samochodow Malolitrazowych "BOSMAL". Method and apparatus for preparation and control of an air-fuel mixture. 4,216,174, Cl. 261-30.000.
Tagami, Masahiro. Protective unit for water pipes and a method for setting the unit. 4,215,726, Cl. 138-30.000.
Takahashi, Hiroshi: *See—*
Horiuchi, Kaoru; Matsui, Akio; Hara, Masahiro; and Takahashi, Hiroshi, 4,216,014, Cl. 75-128.00C.
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, 4,216,246, Cl. 427-43.100.
Takahashi, Jun: *See—*
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Takahashi, Masaru: *See—*
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Takahashi, Shinobu, to Sansui Electric Co., Ltd. Protection circuit for power amplifier. 4,216,517, Cl. 361-79.000.
Takamatsu, Hiroshi: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,215,902, Cl. 303-119.000.
Takayama, Seizo; and Hashimoto, Kiyoshi, to Ube Industries, Ltd. Resin moulding screws. 4,215,978, Cl. 425-190.000.
Takeda Riken Kogyo Kabushikikaisha: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; and Shimada, Katsumi, 4,216,533, Cl. 365-230.000.
Takeuchi, Hiroshi; Inoue, Hideaki; Kawabata, Hidetsugu; and Ishiwatari, Keizo, to Matsushita Electric Industrial Co., Ltd. Composite diaphragm for speaker. 4,216,271, Cl. 428-607.000.
Tamura, Akira: *See—*
Suzuki, Yasuo; Tamura, Akira; and Matsumoto, Kenji, 4,215,734, Cl. 152-209.0WT.
Tamura, Tatsuo: *See—*
Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,216,228, Cl. 424-322.000.
Tanaka, Hajimu. Humidifier. 4,216,176, Cl. 261-142.000.
Tanaka, Hitoshi: *See—*
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,102, Cl. 252-63.200.
Tanaka, Kazuyuki; and Oda, Tatsuro, to Toyo Kogyo Co., Ltd. Exhaust gas purifying apparatus for automobile multi-cylinder engine. 4,215,539, Cl. 60-278.000.
Tanaka, Kazuyuki; Kobayashi, Kazuo; Oda, Tatsuro; and Nakazumi, Tadataka, to Toyo Kogyo Co., Ltd. Dual-catalyst exhaust gas purifying apparatus for multi-cylinder engine. 4,215,541, Cl. 60-284.000.
Tanaka, Kazuyuki: *See—*
Kobayashi, Kazuo; Nakazumi, Tadataka; Oda, Tatsuro; and Tanaka, Kazuyuki, 4,215,540, Cl. 60-278.000.
Kobayashi, Kazuo; Oda, Tatsuro; Nakazumi, Tadataka; and Tanaka, Kazuyuki, 4,215,542, Cl. 60-290.000.
Tanida, Hiroshi; and Irie, Tadashi, to Shionogi & Co., Ltd. 9,10-Dihydro-9,10-methanoanthracene N-oxide derivatives. 4,216,231, Cl. 424-330.000.
Taniyama, Takashi: *See—*
Amazawa, Kiyoshi; Mori, Masaharu; and Taniyama, Takashi, 4,216,430, Cl. 455-219.000.
Tao, Kazuo: *See—*
Kohama, Kazuo; Hashimoto, Akira; Nakamura, Junichi; and Tao, Kazuo, 4,215,988, Cl. 8-448.000.
Tassie, Douglas P.; and Pustell, Robert A., to General Electric Company. Ignition device. 4,215,620, Cl. 86-1.00R.
Tatsumi, Susumu: *See—*
Miyakawa, Seiichi; Tatsumi, Susumu; and Sakamoto, Koji, 4,215,930, Cl. 355-14.00D.
Tatsuzawa, Yoshinobu; Sakamoto, Masayuki; and Wasai, Hiromi, to Matsushita Electric Industrial Co., Ltd.; and Nippon Telegraph & Telephone Public Corp. Pulse signal receiving system employing space diversity. 4,216,428, Cl. 375-75.000.
Taylor, William M.: *See—*
Cox, Fern H.; Taylor, William M.; and Just, Friedrich E., 4,215,747, Cl. 166-85.000.
TDK Electronics Co., Ltd.: *See—*
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.

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Telex Communications, Inc.: *See*—
Flygstad, Dean W.; and Petelle, James F., 4,216,507, Cl. 360-92.000.
Telfer, Alexander: *See*—
Griffin, Leonard H.; Hunt, Richard H.; and Telfer, Alexander, 4,216,376, Cl. 250-357.000.
Temme, George H., to Upjohn Company, The. Process for making triethylene diamines. 4,216,322, Cl. 544-352.000.
Temple, Harold E.: *See*—
United States of America, National Aeronautics and Space Administration; Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E., 4,216,186, Cl. 422-246.000.
Ten-O-One Inc.: *See*—
Meijer, Leo, 4,215,501, Cl. 40-559.000.
Teramachi, Hiroshi. Linear cross roller bearing. 4,215,904, Cl. 308-6.00R.
Terec, Lazar: *See*—
Puscas, Ioan; Chiu, Aurel; Voicu, Livia; Breazu, Dorin; Ciupe, Iuliu; Pop, Ioan; Buten, Mioara R.; Terec, Lazar; and Lerintiu, Aurel, 4,216,207, Cl. 424-164.000.
Terman, David S.; Sulliva, Michael; and Cullis, Herbert M., to Baxter Travenol Laboratories, Inc. Apparatus for the extracorporeal treatment of disease. 4,215,688, Cl. 128-214.00R.
Terry, Edward E. Sound responsive light device. 4,216,464, Cl. 340-321.000.
ter Wijlen, Hendrikus, to Wavin B.V. Plastic well pipe. 4,215,727, Cl. 138-112.000.
Texaco Development Corp.: *See*—
Hunter, Walter D., 4,216,098, Cl. 252-8.55D.
Texaco Inc.: *See*—
Yaffe, Roberta, 4,216,100, Cl. 252-46.700.
Texas Instruments Incorporated: *See*—
Bilek, Frank T., 4,216,511, Cl. 360-133.000.
Edwards, Jon L., 4,216,458, Cl. 338-32.00H.
Slagel, Gary A.; and Bonfield, Peter L., 4,216,522, Cl. 361-392.000.
Thawley, Clive S.: *See*—
Bayley, Barry J.; Brittain, Austin; Graham, Kenneth; and Thawley, Clive S., 4,215,928, Cl. 354-319.000.
Theler, Jean-Jacques: *See*—
Ames, Adolf; Theler, Jean-Jacques; and Wagner, Alfred, 4,215,560, Cl. 72-258.000.
Thermal Dynamics, Inc.: *See*—
Riggs, Roger E.; and Shell, Michael D., 4,215,674, Cl. 126-438.000.
Thetford Corporation: *See*—
Antos, John M.; Henke, Arthur W.; Lindsay, Erin J.; and Embach, James T., 4,215,445, Cl. 4-323.000.
Thiele, Alfred. Sling mounting head. 4,215,891, Cl. 294-74.000.
Thomas, Berwyn C., to Imperial Chemical Industries Limited. Method of injection-moulding onto a preformed web. 4,216,184, Cl. 264-229.000.
Thomas C. Elder, Inc.: *See*—
Kaufman, Kurt D., 4,216,154, Cl. 260-343.210.
Thomas, Louis O.; and Boudreaux, Raymond E. Dental hygiene flossing system. 4,215,478, Cl. 433-25.000.
Thompson, Jerome B. Method of baking an English muffin and product thereof. 4,216,241, Cl. 426-549.000.
Thompson, John D., to Hickson & Welch Limited. Stable dispersions of fluorescent whitening agents of the bis-triazinylaminostilbene group in free acid form and method of preparing same. 4,216,111, Cl. 252-301.230.
Thomson-CSF: *See*—
Vergnolle, Claude; and Val, Christian, 4,216,444, Cl. 333-81.00R.
Timex Corporation: *See*—
Grace, James W., 4,216,416, Cl. 318-128.000.
Toba, Shigeru: *See*—
Shirai, Mitsuru; Okamura, Katsutoshi; Toba, Shigeru; Harada, Shundo; and Mitsuura, Yaeko, 4,216,240, Cl. 426-516.000.
Tobias, Jaromir, to American Hydraulic Propulsion Systems, Inc. Axial piston hydraulic pumps or motors with improved valving. 4,215,624, Cl. 91-499.000.
Todd, Alec: *See*—
Ross, William J.; and Todd, Alec, 4,216,219, Cl. 424-272.000.
Todd, John E.: *See*—
Botsco, Ronald J.; Todd, John E.; and Jones, Robert L., 4,215,583, Cl. 73-582.000.
Todokoro, Masatoshi. Toy television set with musical box. 4,215,511, Cl. 46-175.00R.
Tokuyama, Shunji; and Sugawara, Hiroyuki, to Hitachi, Ltd. D.C. Circuit breaker. 4,216,513, Cl. 361-13.000.
Tokyo Shibaura Electric Co., Ltd.: *See*—
Kunii, Yutaka; Shimoji, Toshikuni; and Jingu, Masaharu, 4,215,585, Cl. 73-633.000.
Matsuda, Takashi; Niwa, Kazuo; and Sumitomo, Yasusuke, 4,216,491, Cl. 357-49.000.
Tomlinson, Peter; and Healy, Dennis. Navigation aid. 4,216,538, Cl. 367-89.000.
Tompkins, Richard M.; and Graham, Jerome L. Apparatus and method for detecting a substance in a fluid medium. 4,216,425, Cl. 324-443.000.
Tonali, Roberto; and Bertolini, Raffaello, to Bertolini, Raffaello. Polyvinylbutyrate sheet staining process for the manufacture of laminated and bulletproof glass as well as product obtained by said process. 4,216,269, Cl. 428-500.000.
Torregrossa, Louis O.: *See*—
Bentvelzen, Jozef M.; Bogart, Steven L.; Gupta, Maharaj K.; McKean, William T.; Meredith, Michael D.; and Torregrossa, Louis O., 4,216,054, Cl. 162-57.000.
Toshiba Silicone Co., Ltd.: *See*—
Simizu, Chiyuki, 4,216,140, Cl. 260-45.75R.
Toth, Paul; and Cross, Kenneth O., to N. A. Woodworth Company. Floating work driver chuck. 4,215,605, Cl. 82-40.00R.
Towner, Ronald D.: *See*—
Bonomo, Melvin E.; Coldren, Kenneth M.; Rathbun, Loren L.; and Towner, Ronald D., 4,215,569, Cl. 73-134.000.
Toyo Jozo Kabushiki Kaisha: *See*—
Ikuta, Shigeru; Matsuura, Kazuo; and Horiuchi, Yoshifumi, 4,216,292, Cl. 435-191.000.
Toyo Kogyo Co., Ltd.: *See*—
Kobayashi, Kazuo; Nakazumi, Tadataka; Oda, Tatsuro; and Tanaka, Kazuyuki, 4,215,540, Cl. 60-278.000.
Kobayashi, Kazuo; Oda, Tatsuro; Nakazumi, Tadataka; and Tanaka, Kazuyuki, 4,215,542, Cl. 60-290.000.
Tanaka, Kazuyuki; and Oda, Tatsuro, 4,215,539, Cl. 60-278.000.
Tanaka, Kazuyuki; Kobayashi, Kazuo; Oda, Tatsuro; and Nakazumi, Tadataka, 4,215,541, Cl. 60-284.000.
Toyo Soda Manufacturing Company, Limited: *See*—
Otsuki, Susumi; Yamada, Shizuo; and Ono, Yaichro, 4,216,323, Cl. 544-352.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Morishita, Teru, 4,215,979, Cl. 431-264.000.
Tsuzuki, Yoshihiko, 4,215,960, Cl. 409-121.000.
Transaction Management, Inc.: *See*—
Hunter, Alexander, 4,216,508, Cl. 360-93.000.
Trawinski, Helmut F., to Amberger Kaolinwerke GmbH Co. Method and arrangement for continuous regulation of the specific slime gravity or slime concentration in settling chambers. 4,216,081, Cl. 209-496.000.
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., to International Flavors & Fragrances Inc. Use in smoking tobacco compositions and smoking tobacco articles of 1-acyl-2,6,6-trimethylcyclohexene derivatives. 4,215,704, Cl. 131-17.00R.
Trennjager Maschinenfabrik, Inh. Leopold Jagers: *See*—
Jagers, Leopold, 4,215,958, Cl. 408-38.000.
Trio Kabushiki Kaisha: *See*—
Sakaida, Kaku, 4,216,437, Cl. 330-298.000.
Trittipoe, Jack H., to Caterpillar Tractor Co. Tube clamp. 4,215,880, Cl. 285-61.000.
Triumph Werke Nurnberg A.G.: *See*—
Gottsmann, Helmut; and Scheinpflug, Gunter, 4,215,944, Cl. 400-314.000.
Trosch, Paul, to Georg Fischer Limited. Unidirectional valve. 4,215,717, Cl. 137-533.250.
Trout, Robert G.: *See*—
Gay, Derek J.; Trout, Robert G.; Chin, Manuel G. Y.; and Sawyer, James E., 4,215,843, Cl. 249-78.000.
TRW Inc.: *See*—
Lillie, Charles R., 4,215,955, Cl. 407-42.000.
Stenzel, Reiner L.; and Daley, William F., 4,216,405, Cl. 313-310.000.
Vaughan, Robert W.; O'Rell, Michael K.; and Sheppard, Clyde H., 4,216,297, Cl. 525-334.000.
Tsang, Won-Tien, to Bell Telephone Laboratories, Incorporated. Self-terminating thermal oxidation of Al-containing group III-V compound layers. 4,216,036, Cl. 148-175.000.
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Yamasaki, Akitoshi; and Miyauchi, Kajunori, 4,215,972, Cl. 414-742.000.
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Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,215,931, Cl. 355-14.00R.
Tsuetaki, George F.: *See*—
Novicky, Nick N., 4,216,303, Cl. 528-32.000.
Tsuruoka, Takashi: *See*—
Fukuyasu, Harumi; Ohya, Zenichiro; Kawakami, Katsuo; Kikuchi, Takahiko; Shomura, Takashi; Tsuruoka, Takashi; Watanabe, Tetsuro; Kazuno, Yuzo; Inouye, Shigeharu; and Sekizawa, Yasuharu, 4,216,226, Cl. 424-311.000.
Tsuzuki, Yoshihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Copying-milling apparatus. 4,215,960, Cl. 409-121.000.
Tu, Shu T.: *See*—
Lorenz, Donald H.; Tu, Shu T.; and Wyman, Donald P., 4,216,267, Cl. 428-412.000.
Tuckmantel, Hans-Joachim, to Kempchen & Co. GmbH. Partitioned heat-exchanger shell. 4,215,745, Cl. 165-160.000.
Tufts, Wesley M. Fluid metering device. 4,215,573, Cl. 73-255.000.
Tull, Roger J.: *See*—
Shuman, Richard F.; and Tull, Roger J., 4,216,317, Cl. 544-277.000.
Tundo, Antonio: *See*—
Battisti, Ruggero; Boffa, Gioacchino; Mazzaferro, Nicola; Mangini, Angelo; and Tundo, Antonio, 4,216,145, Cl. 260-156.000.
Turk, Chester F.: *See*—
Krapcho, John; and Turk, Chester F., 4,216,335, Cl. 560-35.000.
Turk, Richard S.; and Zipp, Adam P., to Miles Laboratories, Inc. Test means and assay for determining the urea content of fluids. 4,215,995, Cl. 23-230.00R.

Turley, Wilfred H.; and Robinson, John A., to Plessey Handel und Investments AG. Optical fibre connectors. 4,215,913, Cl. 350-96.210.
Turner, Arthur G. Packing machine. 4,215,523, Cl. 53-496.000.
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Budelman, Gerald A.; and Turner, James A., 4,215,619, Cl. 84-1.280.
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Gaule, Gerhard K.; Yarwood, John C.; and Tyler, Derek E., 4,215,738, Cl. 164-49.000.
U C B, Societe Anonyme: *See*—
Couteau, Willy; and Ramioulle, Jean, 4,216,339, Cl. 560-232.000.
de Lannoy, Jean, 4,216,221, Cl. 424-274.000.
U.M.C. Industries, Inc.: *See*—
Johnson, Raymond A., 4,215,773, Cl. 194-9.00R.
Uba, Toshio, to Gates Rubber Company, The. Vibration resistant electrochemical cell. 4,216,277, Cl. 429-175.000.
Ube Industries, Ltd.: *See*—
Takayama, Seizo; and Hashimoto, Kiyoshi, 4,215,978, Cl. 425-190.000.
Uchida, Minoru: *See*—
Nakagawa, Kazuyuki; Uchida, Minoru; and Oka, Kimiaki, 4,216,220, Cl. 424-274.000.
Ueoka, Hisayoshi: *See*—
Fujiwara, Shinobu; Furukawa, Kiyoshi; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,103, Cl. 252-63.200.
Furukawa, Kiyoshi; Fujiwara, Shinobu; Kikuchi, Nobuaki; Iizawa, Osamu; Tanaka, Hitoshi; and Ueoka, Hisayoshi, 4,216,102, Cl. 252-63.200.
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Manzke, Klaus; Brotzler, Roland; Berg, Gerhard; and Uhl, Karl, 4,216,510, Cl. 360-99.000.
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., to A-T-O Inc. Self-contained programmable terminal for security systems. 4,216,375, Cl. 235-382.000.
Ulics, George, to Ford Motor Company. Pick-up box construction. 4,215,898, Cl. 296-183.000.
Union Carbide Corporation: *See*—
Lundell, Edwin O.; and Smarook, Walter H., 4,216,254, Cl. 428-35.000.
Mellors, Geoffrey W., 4,216,279, Cl. 429-191.000.
Patterson, Michael F.; and Acharya, Arun, 4,215,798, Cl. 220-421.000.
Powell, John L.; Rekemeyer, Peter C.; and Falk, Earl E., 4,216,053, Cl. 159-48.00R.
Union Oil Company of California: *See*—
Young, Donald C., 4,215,996, Cl. 23-300.000.
Union Tank Car Company: *See*—
Parsons, James D., 4,215,788, Cl. 220-22.000.
Uniroyal Limited: *See*—
Bayley, Barry J.; Brittain, Austin; Graham, Kenneth; and Thawley, Clive S., 4,215,928, Cl. 354-319.000.
United Aircraft Products, Inc.: *See*—
Anthony, Robert E., 4,215,454, Cl. 29-157.30R.
Lord, Thomas J., 4,215,816, Cl. 236-99.00E.
United States of America
Agriculture: *See*—
Klun, Jerome A.; Plimmer, Jack R.; Sparks, Alton N.; and Leonhardt, Barbara B., 4,216,202, Cl. 424-84.000.
Air Force: *See*—
Forsberg, John D., 4,215,634, Cl. 102-228.000.
Schack, Carl J.; and Christe, Karl O., 4,216,338, Cl. 560-227.000.
Shaffstall, Robert M.; Burton, Russell R.; and Jaggars, Jamy L., 4,215,712, Cl. 137-39.000.
Army: *See*—
Abajian, Anthony, 4,216,445, Cl. 333-81.00R.
Dias, Gil M., 4,216,261, Cl. 428-264.000.
Farace, Louis P., 4,215,635, Cl. 102-238.000.
Garber, Esther B.; and Cox, Lloyd, 4,215,568, Cl. 73-73.000.
Johnson, Richard N., 4,216,475, Cl. 343-100.0SA.
Litt, Eric S., 4,216,546, Cl. 455-164.000.
Pierce, Everette M., 4,216,039, Cl. 149-19.400.
Zacharin, Alexey T., 4,215,836, Cl. 244-138.00R.
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Dew-Hughes, David, 4,215,465, Cl. 29-599.000.
Eer Nisse, Errol P., 4,215,570, Cl. 73-141.00R.
Sullivan, Richard W., 4,216,110, Cl. 252-301.10R.
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Moss, Gerald, 4,216,197, Cl. 423-638.000.
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Berkman, Samuel; Kim, Kyong-Min; and Temple, Harold E. Means for growing ribbon crystals without subjecting the crystals to thermal shock-induced strains. 4,216,186, Cl. 422-246.000.
Hermesmeyer, Charles E. Method and apparatus for quadriphase-shift-key and linear phase modulation. 4,216,542, Cl. 375-67.000.
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Bahiman, Hossein, 4,215,590, Cl. 474-205.000.
Beremand, Donald G., 4,215,548, Cl. 60-520.000.
Calvert, John A., 4,215,592, Cl. 74-661.000.
Navy: *See*—
Anderson, Matthew E.; Zvada, Timothy P.; and Waller, Jack T., Jr., 4,215,633, Cl. 102-210.000.
Crist, Ralph P., 4,215,571, Cl. 73-170.00A.
Dunlap, Richard M., 4,215,834, Cl. 244-97.000.
Gregory, John B.; Schwope, Arthur D.; and Wise, Donald L., 4,215,686, Cl. 128-156.000.
Lorenz, Richard; and Martin, Paul E., 4,216,476, Cl. 343-120.000.
Rahn, John P.; and Hughes, Richard S., 4,216,440, Cl. 331-94.50C.
Rucker, Klaus G., 4,215,631, Cl. 102-27.00R.
Silvestri, Giovanni J., 4,215,533, Cl. 60-39.630.
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Spiess, Fred N., 4,215,572, Cl. 73-170.00A.
Wells, William E., 4,216,534, Cl. 367-1.000.
Transportation: *See*—
Dowd, Theodore, 4,216,187, Cl. 423-98.000.
U.S. Philips Corporation: *See*—
Brehm, Rudolf; and Franken, Adrianus J. J., 4,216,004, Cl. 65-2.000.
Bruning, Hugo A. C. M.; Van Vocht, Johannes H. N.; Westendorp, Frans F.; and Zijlstra, Hinne, 4,216,274, Cl. 429-57.000.
Buunk, Jan R.; Dorsemagen, Bernardus M. A.; and Van Dijkman, Johannes G. H., 4,215,456, Cl. 29-25.130.
Kuiper, Adrianus; Boelens, Paulus R.; and Blanken, Jacob, 4,215,457, Cl. 29-25.140.
Valkestijn, Leonardus A. A., 4,216,392, Cl. 307-268.000.
van Dam, Rudolf A. A. F.; and Immink, Kornelis A., 4,216,419, Cl. 318-327.000.
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,216,408, Cl. 313-468.000.
United States Steel Corporation: *See*—
Kelly, Calvin E.; and Stanley, Richard W., 4,216,062, Cl. 202-248.000.
Knechtel, Herbert E.; and Podgurski, Harry H., 4,216,033, Cl. 148-16.600.
Lewis, Leon L.; and Murray, Michael V., 4,215,794, Cl. 220-270.000.
United Technologies Corporation: *See*—
Lewis, George D., 4,215,535, Cl. 60-736.000.
Wachner, Glenn C., 4,216,414, Cl. 315-405.000.
Wagner, Robert A., 4,216,401, Cl. 310-313.00R.
Wahl, Roger L.; and Dye, John A., 4,215,823, Cl. 239-553.300.
Unitron Corporation: *See*—
Zaderej, Andrew, 4,216,443, Cl. 331-115.000.
University of California, Regents of the: *See*—
Demetrescu, Mihai C., 4,215,697, Cl. 128-731.000.
University of Delaware: *See*—
Rechnitz, Garry A.; Arnold, Mark A.; and Meyerhoff, Mark E., 4,216,065, Cl. 204-1.00T.
University of Florida, Board of Regents, State of Florida, Tallahassee, Florida, for the use and benefit of the: *See*—
Dove, Derek B., 4,215,918, Cl. 350-357.000.
UOP Inc.: *See*—
Antos, George J., 4,216,346, Cl. 585-379.000.
Michalko, Edward, 4,216,122, Cl. 252-448.000.
Uozu, Nobuo: *See*—
Iwasaki, Yorio; Okamura, Toshiro; Nakaso, Akishi; Uozu, Nobuo; and Takahashi, Hiroshi, 4,216,246, Cl. 427-43.100.
Uozumi, Yukio; and Mizoshita, Fumitaka, to Kawasaki Jukogyo Kabushiki Kaisha. Track switching means for guideway vehicles. 4,215,837, Cl. 246-433.000.
Upjohn Company, The: *See*—
Hessler, Edward J.; and VanRheenen, Verlan H., 4,216,159, Cl. 260-397.100.
Johnson, Roy A., 4,216,336, Cl. 560-53.000.
Temme, George H., 4,216,322, Cl. 544-352.000.
Urbanietz, Josef: *See*—
Loewe, Heinz; Urbanietz, Josef; Duwel, Dieter; and Kirsch, Reinhard, 4,216,161, Cl. 260-456.00A.
Urso, Patrick F.: *See*—
Herdzina, Frank J.; and Urso, Patrick F., 4,216,044, Cl. 156-215.000.
Ushiyama, Masato: *See*—
Yoshida, Takechiyo; Ushiyama, Masato; and Yokoyama, Tohru, 4,216,118, Cl. 252-415.000.
USM Corporation: *See*—
Szewczyk, Richard S., 4,215,482, Cl. 33-181.00R.
Vaccaro, Frank E., to RCA Corporation. Flat panel display device with beam collector. 4,216,407, Cl. 313-422.000.
Vaisberg, Tsaly I.: *See*—
Isakov, Viktor L.; Popov, Yan Y.; Vaisberg, Tsaly I.; Kharzhevsky, Rostislav A.; Pshenichny, Vladimir M.; Koba, Andrei I.; Khlyvnjuk, Boris G.; Solomko, Nikolai N.; Kudryavtsev, Ivan V., deceased; and Kudryavtseva, Galina A., administrator, 4,215,694, Cl. 128-303.100.
Vajtay, Leslie. Tubular package for fragile objects. 4,215,779, Cl. 206-421.000.
Val, Christian: *See*—
Vergnolle, Claude; and Val, Christian, 4,216,444, Cl. 333-81.00R.
Valkestijn, Leonardus A. A., to U.S. Philips Corporation. Circuit for producing a periodic parabolic signal. 4,216,392, Cl. 307-268.000.
van Dam, Rudolf A. A. F.; and Immink, Kornelis A., to U.S. Philips Corporation. Tachometer system. 4,216,419, Cl. 318-327.000.
Van der Aa, Marcel; and Stokbroekx, Raymond, to Janssen Pharmaceutica N.V. Novel (1-arylcycloalkylmethyl) isothiocyanates. 4,216,217, Cl. 424-263.000.
van der Lely, Cornelis. Mowing machine. 4,215,526, Cl. 56-12.700.

VanderLugt, Thomas, Jr., to Brown Company. Carton with reclosure feature. 4,215,783, Cl. 206-626.000.
Vanderveen, John W.; and Mills, King L., to Phillips Petroleum Company. Radial secondary gas flow carbon black reaction method. 4,216,193, Cl. 423-456.000.
van de Spijker, Willebrordus H. M. M.: *See*—
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,216,408, Cl. 313-468.000.
van de Werken, Pieter, to MacGregor International S.A. Gripping and skidding apparatus. 4,215,848, Cl. 254-107.000.
Van Dijkman, Johannes G. H.: *See*—
Buunk, Jan R.; Dorsemagen, Bernardus M. A.; and Van Dijkman, Johannes G. H., 4,215,456, Cl. 29-25.130.
Van Hove, Jan H.: *See*—
De Beul, Victor F.; and Van Hove, Jan H., 4,216,290, Cl. 430-496.000.
VanRheenen, Verlan H.: *See*—
Hessler, Edward J.; and VanRheenen, Verlan H., 4,216,159, Cl. 260-397.100.
Van Roggen, Arend: *See*—
Edwards, Donald W.; Gorondy, Emery J.; and Van Roggen, Arend, 4,216,282, Cl. 430-39.000.
Van Scott, Eugene J.: *See*—
Yu, Ruey J.; and Van Scott, Eugene J., 4,216,224, Cl. 424-286.000.
van Veelen, George F.: *See*—
Sels, Francis J.; Kokelenberg, Hendrik E.; and van Veelen, George F., 4,216,108, Cl. 252-182.000.
Van Vocht, Johannes H. N.: *See*—
Bruning, Hugo A. C. M.; Van Vocht, Johannes H. N.; Westendorp, Frans F.; and Zijlstra, Hinne, 4,216,274, Cl. 429-57.000.
Van Zeeland, Donald L., to Eaton Corporation. Ground fault interrupter. 4,216,515, Cl. 361-45.000.
Vargus Ltd.: *See*—
Hirsch, Mordechai; and Cohen, Ilan, 4,215,871, Cl. 279-48.000.
Vaughan, Robert W.; O'Rell, Michael K.; and Sheppard, Clyde H., to TRW Inc. Vinyl polybutadiene bisimide copolymers. 4,216,297, Cl. 525-334.000.
Vegh, Ladislas J. S.: *See*—
Bamberg, Peter; Vegh, Ladislas J. S.; and Hardegger, Emil, deceased, 4,216,328, Cl. 546-329.000.
Vergnolle, Claude; and Val, Christian, to Thomson-CSF. Step adjustable attenuator. 4,216,444, Cl. 333-81.00R.
Verlijsdonk, Johannus G.: *See*—
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., 4,216,408, Cl. 313-468.000.
Vernon, Lonnie W.: *See*—
Plumlee, Karl W.; and Vernon, Lonnie W., 4,216,078, Cl. 208-143.000.
Verriet, Johannes G.: *See*—
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Verschuur, Eke, to Shell Oil Company. Method for processing a slurry of coal particles in water. 4,216,082, Cl. 209-10.000.
Verstegen, Judicus M. P. J.; Verlijsdonk, Johannus G.; de Meester, Emiel P. J.; van de Spijker, Willebrordus H. M. M.; and Verriet, Johannes G., to U.S. Philips Corporation. Luminescent material and discharge lamp and cathode ray tube containing the same. 4,216,408, Cl. 313-468.000.
Vertes, Michael A. Container cap having means to protect articles. 4,215,786, Cl. 215-231.000.
Vette, Carl W. Method and apparatus for testing electrolytic capacitors. 4,216,424, Cl. 324-62.000.
Vidwans, Mohan P., to Sycor, Inc. Disc recorder with brushless DC motor drive. 4,216,512, Cl. 360-133.000.
Viezee, William: *See*—
Evans, William E.; and Viezee, William, 4,216,498, Cl. 358-93.000.
Vinals, Joaquin: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.
Vincent, David N.; and Chang, Cheng H., to Champion International Corporation. Pressure-sensitive microcapsules containing alkylnaphthalene solvent and process for their production. 4,216,112, Cl. 252-316.000.
Virgilio, Joseph A.; and Freudewald, Joachim E., to Givaudan Corporation. Process for the purification of crude 2,4,5-trichlorophenol. 4,216,342, Cl. 568-755.000.
Vlcek, Richard J., to Mobil Oil Corporation. Method and apparatus for testing a production stream. 4,215,567, Cl. 73-61.10R.
Vock, Manfred H.: *See*—
Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin; Vock, Manfred H.; Vinals, Joaquin; Kiwala, Jacob; and Schmitt, Frederick L., 4,215,704, Cl. 131-17.00R.
Voest-Alpine Aktiengesellschaft: *See*—
Scheurecker, Werner; and Ippisch, Friedrich, 4,215,740, Cl. 164-446.000.
Vogt, Herwart C.; Brizgys, Bernardas; Cenker, Moses; and Patton, John T., Jr., to BASF Wyandotte Corporation. Organic titanium compounds as viscosity improvers for polyol compounds. 4,216,107, Cl. 252-182.000.
Vogtle, Friedrich: *See*—
Weddigen, Gert; Ege, Gunther; and Vogtle, Friedrich, 4,216,276, Cl. 429-104.000.
Voicu, Livia: *See*—
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Volgyesy, Ivan L.: *See*—
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Volkswagenwerk Aktiengesellschaft: *See*—
Renger, Udo, 4,215,820, Cl. 239-90.000.
von Dreusche, Charles F., Jr., to Nichols Engineering & Research Corp. Heating or combustion apparatus and method. 4,215,981, Cl. 432-139.000.
Vorbeck, Donald W., to Atco Manufacturing Co., Inc. Baby turtle isolation habitat. 4,215,649, Cl. 119-15.000.
Voronin, Georgy A.: *See*—
Garda, Alexandr P.; Andruschak, Oleg A.; Epik, Alexei P.; Kozlov, Sergei A.; Grechishkin, Evgeny F.; Voronin, Georgy A.; Krendelev, Viktor N.; Samsonov, Grigory V., deceased; Samsonov, Nadezhda A., administrator; Samsonov, Natalya G., administrator; and Samsonova, Evgeny G., adminstrator, 4,215,819, Cl. 239-81.000.
Vought, John O.: *See*—
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W. H. Brady Co.: *See*—
Gehweiler, Edward C., 4,216,048, Cl. 156-344.000.
W-K-M Wellhead Systems, Inc.: *See*—
Hallden, Donald F.; Peters, Clifford M.; and McCary, L. V., Jr., 4,215,746, Cl. 166-53.000.
W. R. Grace & Co.: *See*—
O'Rell, Dennis D.; Palmer, Nigel I.; and Nguyen, Vu H., 4,216,281, Cl. 429-252.000.
Smith, Richard J., Jr.; and Bellino, Ralph R., 4,215,658, Cl. 123-41.440.
Winyall, Milton E., 4,216,113, Cl. 252-317.000.
Wada, Tasaku: *See*—
Nakabo, Satoru; Wada, Tasaku; and Mihira, Kazumasa, 4,215,946, Cl. 400-689.000.
Wada, Yoshihiro: *See*—
Horie, Itsuo; and Wada, Yoshihiro, 4,215,948, Cl. 401-265.000.
Waehner, Glenn C., to United Technologies Corporation. Isolation transformer for a magnetic deflection yoke. 4,216,414, Cl. 315-405.000.
Wagensonner, Eduard; and Cocron, Istvan, to AGFA-Gevaert, A.G. Speed regulation of D.C. motor using counter. 4,216,418, Cl. 318-318.000.
Wages, Dwight E., to Procter & Gamble Company, The. Method and apparatus for cleansing and disinfecting a flushing toilet. 4,216,027, Cl. 134-36.000.
Wagner, Alfred: *See*—
Ames, Adolf; Theler, Jean-Jacques; and Wagner, Alfred, 4,215,560, Cl. 72-258.000.
Wagner, Donald G. Road grade attachment. 4,215,495, Cl. 37-109.000.
Wagner, Robert A., to United Technologies Corporation. Surface acoustic wave (SAW) pressure sensor structure. 4,216,401, Cl. 310-313.00R.
Wahl, Roger L.; and Dye, John A., to United Technologies Corporation. Laser nozzle construction. 4,215,823, Cl. 239-553.300.
Wakabayashi, Takao, to Nakanishi Metal Works Co., Ltd. Wheel assembly with bearings. 4,215,905, Cl. 308-182.000.
Wakamatsu, Hisato: *See*—
Akita, Sigeyuki; and Wakamatsu, Hisato, 4,215,575, Cl. 73-339.00A.
Wakerly, John F.: *See*—
Boleda, Alberto; and Wakerly, John F., 4,216,544, Cl. 375-119.000.
Walker, Francis H., to Stauffer Chemical Company. Alkyl or alkoxy-O-alkyl-S-[N-(2-alkyl, phenyl or vinyl-1,3-dioxolan-4-yl) methylaminoacetyl] dithiophosphates or phosphonates as insecticides and acaricides. 4,216,222, Cl. 424-278.000.
Waller, Gail J., to Gerow, Kenneth W.; and Gerow, Joyce M., part interest to each. Vehicular fire suppressant system having a frangible fire extinguishant housing. 4,215,752, Cl. 169-58.000.
Waller, Jack T., Jr.: *See*—
Anderson, Matthew E.; Zvada, Timothy P.; and Waller, Jack T., Jr., 4,215,633, Cl. 102-210.000.
Walter, Donald P. G., to AMP Incorporated. Electrical connector. 4,215,910, Cl. 339-143.00R.
Wampfler GmbH: *See*—
Bormann, Uwe, 4,215,770, Cl. 191-23.00R.
Wang, Richard H. S.; and Irick, Gether, Jr., to Eastman Kodak Company. Thermally stabilized polyolefin compositions. 4,216,137, Cl. 260-42.460.
Waring, Charles D.: *See*—
Hines, David M.; and Waring, Charles D., 4,215,579, Cl. 73-424.000.
Wary, Joseph C.: *See*—
Roberts, Marvin A.; and Wary, Joseph C., 4,215,827, Cl. 242-55.010.
Wasai, Hiromi: *See*—
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Watanabe, Akira; Sugimoto, Tetsuya; Kusaka, Yukio; Shinoda, Noboru; and Shimizu, Takanori, to Kyusyu Refractories Co., Ltd. Carbonaceous bricks and the method for producing the same. 4,216,020, Cl. 106-56.000.
Watanabe, Noritoshi; Yamamoto, Riyozo; Shoji, Isao; and Yagi, Hisanori, to Kanzaki Paper Manufacturing Co., Ltd. Electrostatic

recording material and the method of preparing it. 4,216,055, Cl. 162-117.000.
Watanabe, Tetsuro: *See*—
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Weatherston, Roger C., to Calspan Corporation. Pulse-free blower. 4,215,977, Cl. 418-1.000.
Weaver, Albert E. Method of making a preformed bathing vessel. 4,216,042, Cl. 156-62.200.
Webb, Cyril J.: *See*—
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Wedgwood, Gordon J. Arm net system for ejection seats. 4,215,835, Cl. 244-122.0AG.
Weed, Lauren R., to Blackstone Corporation. Exhaust coolers. 4,215,742, Cl. 165-51.000.
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Weinstock, Leonard M.; Wildman, Arthur S.; and Bagner, Carl, to Merck & Co., Inc. Preparation of 5-(2,4-difluorophenyl)salicylic acid and derivatives. 4,216,340, Cl. 562-469.000.
Weiste, Heinrich. Pneumatically-operated machine for spreading granular material. 4,215,824, Cl. 239-655.000.
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Williams, Robert A.; Cotton, William A.; and Hoskinson, Robert B. Winding apparatus. 4,215,831, Cl. 242-158.00F.
Willson, James K. V. Variable stiffness guide wire. 4,215,703, Cl. 128-772.000.
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Wilson, Harlan R. Collector's device. 4,215,499, Cl. 40-158.00R.
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Wilson, Michael T., to Haslam, Thomas, a part interest. Prosthetic hip. 4,215,441, Cl. 3-15.000.
Wilson, Robert E., to RCA Corporation. Narrow pulse eliminator. 4,216,388, Cl. 307-234.000.
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Windram, Michael D.: *See*—
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Winocur, Joseph, to Rockwell International Corporation. Shared pointing for offset target of an adaptive phased array. 4,215,936, Cl. 356-5.000.
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Workman, William, Jr.; and Bos, John R., to Cooper Industries, Inc. Torque responsive speed shift mechanism for power tool. 4,215,594, Cl. 74-751.000.

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Yamaki, Kiyoshi; Mizote, Masanori; Oka, Takashi; Matsuoka, Hideoki; Nomura, Hiroyuki; Mogi, Takaaki; and Mimura, Akitoshi, to Nissan Motor Company, Limited. Navigation instrument for roadway vehicles. 4,216,530, Cl. 364-565.000.

Yamamoto, Riyozo: *See*—
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Yamashita, Shin: *See*—
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Yeowell, David A.; and Swaringen, Roy A., Jr., to Burroughs Wellcome Co. Synthesis of 2,4-diamino-5-benzylpyrimidines using benzyl cyanoacetal intermediates. 4,216,319, Cl. 544-325.000.

Yokley, Tommey A., Jr.: *See*—
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Yoshida, Minoru: *See*—
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Yoshida, Takechiyo; Ushiyama, Masato; and Yokoyama, Tohru, to Chiyoda Chemical Engineering & Construction Co., Ltd. Process for recovering vanadium accumulated on spent catalyst. 4,216,118, Cl. 252-415.000.

Yoshikawa, Takashi; Kato, Shigeru; Obata, Akira; Shibazaki, Hiroshi; Ishikawa, Shigeaki; and Satoh, Toshio, to Japan Aircraft Mfg. Co., Ltd. Water-surface towed target. 4,215,862, Cl. 273-350.000.

Yoshinari, Hideki: *See*—
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Clift, Gunther K.; Young, David; and Fix, Brian S., 4,215,522, Cl. 53-378.000.

Young, Donald C., to Union Oil Company of California. Controlling sulfur particle hardness. 4,215,996, Cl. 23-300.000.

Younger, Dwen R. Trailer hitch. 4,215,875, Cl. 280-478.00B.

Youngkin, Theodore C.: *See*—
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,215,800, Cl. 221-129.000.

Yu, Ruey J.; and Van Scott, Eugene J. Methods and compositions for treating psoriasis with retinoyl compounds. 4,216,224, Cl. 424-286.000.

Yuasa Battery Company Limited: *See*—
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Yuasa, Hitoshi; and Imai, Hirosuke, to Nippon Oil Company, Ltd. Polyhexamethylenimine and process for its preparation. 4,216,307, Cl. 528-422.000.

Zacharias, Theodor, to Friedrich Kocks GmbH & Company, Firma. Cooling bed for elongate articles. 4,215,855, Cl. 266-259.000.

Zacharin, Alexey T., to United States of America, Army. Inflatable decelerator. 4,215,836, Cl. 244-138.00R.

Zaderej, Andrew, to Unitron Corporation. Transistor resonant circuit power oscillators. 4,216,443, Cl. 331-115.000.

Zajaczkowski, Ryszard: *See*—
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Zalipsky, Jerome J.: *See*—
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Diamond, Julius; and Zalipsky, Jerome J., 4,216,230, Cl. 424-322.000.

Zalkin, Daniel; and Maillot, Jean-Pierre, to Assistance Technique Medicale Serdahl, S.A. Respirator for the treatment of persons suffering from respiratory insufficiencies. 4,215,681, Cl. 128-204.210.

Zanker, Klaus J., to Agar Instrumentation Inc. Method and apparatus for testing a fluid. 4,215,565, Cl. 73-30.000.

Zehntel, Inc.: *See*—
Raymond, Douglas W.; and Garrett, Thomas C., 4,216,539, Cl. 371-20.000.

Zellerman, Gabor: *See*—
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Zenitz, Bernard L., to Sterling Drug Inc. Intermediates for preparing anti-inflammatory phenyl-lower-alkylamines. 4,216,326, Cl. 546-226.000.

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Zicko, James A., to Container Corporation of America. Container with hinged cover. 4,215,810, Cl. 229-33.000.

Ziel, Richard E.: *See*—
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Zielke, Darrell W., to West American Sound, Inc. Automatic threading mechanism for a cassette loader. 4,216,052, Cl. 156-502.000.

Zijlstra, Hinne: *See*—
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Zimmer, USA: *See*—
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Zipp, Adam P.: *See*—
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Zoller, Heinrich: *See*—
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Zvada, Timothy P.: *See*—
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Zweig, Judith E.; and Himes, Glenn R., to Shell Oil Company. HDPE-Containing footwear composition. 4,216,132, Cl. 260-33.6AQ.
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF AUGUST, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm and Haas Company. Herbicidal 4-trifluoromethyl-4-nitrodiphenyl ethers. Re. 30,361, Cl. 260-465.00F.

Berman, Herbert; and Pastan, Harvey L. Hand drilling. Re. 30,356, Cl. 433-131.000.

Dawson, Daniel J.: *See*—
Gless, Richard D., Jr.; Dawson, Daniel J.; and Wingard, Robert E., Jr., Re. 30,362, Cl. 525-355.000.

Dynapol: *See*—
Gless, Richard D., Jr.; Dawson, Daniel J.; and Wingard, Robert E., Jr., Re. 30,362, Cl. 525-355.000.

Geode Industries, Inc.: *See*—
Henry, Henry L., Re. 30,357, Cl. 51-229.000.

Gless, Richard D., Jr.; Dawson, Daniel J.; and Wingard, Robert E., Jr., to Dynapol. Process for preparing polyvinylamine and salts thereof. Re. 30,362, Cl. 525-355.000.

Henry, Henry L., to Geode Industries, Inc. Device for grinding a cabachon. Re. 30,357, Cl. 51-229.000.

International Flavors & Fragrances Inc.: *See*—
Kratz, Philip deC.; and Strasburger, Louis J., Re. 30,363, Cl. 426-534.000.

Kratz, Philip deC.; and Strasburger, Louis J., to International Flavors & Fragrances Inc. Processes for producing strawberry flavor compositions and products. Re. 30,363, Cl. 426-534.000.

Maryland Patent Development Co., Inc.: *See*—
Shubert, Roland H., Re. 30,360, Cl. 209-8.000.

Metzler, Jay C., to Schlegel Corporation. Method of making pile weatherstripping. Re. 30,359, Cl. 156-169.000.

Pastan, Harvey L.: *See*—
Berman, Herbert; and Pastan, Harvey L., Re. 30,356, Cl. 433-131.000.

Rohm and Haas Company: *See*—
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., Re. 30,361, Cl. 260-465.00F.

Schlegel Corporation: *See*—
Metzler, Jay C., Re. 30,359, Cl. 156-169.000.

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Sugiwaka, Takayo; Suzuki, Kiyoshi; Nishioka, Masaki; and Nishiyori, Hiroaki, to Matsushita Electric Industrial Co., Ltd. Television receiver. 256,240, 8-5-80, Cl. D14-81.000.
Suljic, Paul. Holder for elongated implements. 256,253, 8-5-80, Cl. D19-83.000.
Suzuki, Kiyoshi: *See—*
Sugiwaka, Takayo; Suzuki, Kiyoshi; Nishioka, Masaki; and Nishiyori, Hiroaki, 256,240, Cl. D14-81.000.
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Takahashi, Hanji: *See—*
Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 256,209, Cl. D7-128.000.
Takahashi, Yoichi; Harada, Toshio; and Takahashi, Hanji, 256,210, Cl. D7-128.000.
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Tayebi, Ramin. Canister or similar article. 256,207, 8-5-80, Cl. D7-79.000.
Teeri, Niilo H. Fireplace. 256,272, 8-5-80, Cl. D23-97.000.
Thompson, Stanley E. Abduction leg splint. 256,275, 8-5-80, Cl. D24-64.000.
Tokiyama, Masaru: *See—*
Nagele, Albert L.; and Tokiyama, Masaru, 256,236, Cl. D14-59.000.
Tosaw, Richard T. Collapsible periscope. 256,250, 8-5-80, Cl. D16-48.000.
Townsend, Donald L.; Huggler, Peter E.; and Notbohm, Rex L., to McGraw-Edison Company. Portable electric heater. 256,273, 8-5-80, Cl. D23-124.000.

Trend Line Furniture Corporation: *See*—
Collins, Samuel T., 256,193, Cl. D6-71.000.
Turner, Jerome, to Brooks Shoe Manufacturing Co., Inc. Cleated sports shoe sole. 256,180, 8-5-80, Cl. D2-320.000.
Van Horn, James P.; and Rossi, Vincent J. Duct work support. 256,216, 8-5-80, Cl. D8-71.000.
Varrin, Andre J. Note holder. 256,258, 8-5-80, Cl. D20-43.000.
Ventura, Edward. Chair arm tray. 256,201, 8-5-80, Cl. D6-199.000.
Vong, Hoi T. Combined radio, watch case and lighter. 256,237, 8-5-80, Cl. D14-68.000.
W. H. Brine Company: *See*—
Rule, Robert J., 256,176, Cl. D2-27.000.
Warden, Louis K., to Pacific Clay Products. Roof tile or similar article. 256,277, 8-5-80, Cl. D25-80.000.
Winn, David L., to Winn Trading Corp. Inflatable display form. 256,254, 8-5-80, Cl. D20-32.000.
Winn, David L., to Winn Trading Corp. Inflatable display form. 256,255, 8-5-80, Cl. D20-32.000.
Winn, David L., to Winn Trading Corp. Inflatable display form. 256,256, 8-5-80, Cl. D20-32.000.
Winn, David L., to Winn Trading Corp. Inflatable display form. 256,257, 8-5-80, Cl. D20-31.000.
Winn Trading Corp.: *See*—
Winn, David L., 256,254, Cl. D20-32.000.
Winn, David L., 256,255, Cl. D20-32.000.
Winn, David L., 256,256, Cl. D20-32.000.
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Winter, Russell K.; Savas, Nedim; Snively, Joseph H.; and Harvey, Thomas D., to Russell William, Ltd. Clutch bag display unit. 256,198, 8-5-80, Cl. D6-188.000.
Wong, C., to Sonca Industries Limited. Lantern. 256,285, 8-5-80, Cl. D26-42.000.
Wong, Chung C.; and Brindley, Robert E., to Sonca Industries Limited. Lantern. 256,278, 8-5-80, Cl. D26-46.000.
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CLASSIFICATION OF PATENTS

ISSUED AUGUST 5, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

48	4,215,432
	4,215,433
114	4,215,434
227	4,215,435
422	4,215,436
424	4,215,437

CLASS 3

1.9	4,215,438
1.911	4,215,439
13	4,215,440
15	4,215,441
22	4,215,442

CLASS 4

300.3	4,215,443
323	4,215,445
612	4,215,444

CLASS 5

425	4,215,446

CLASS 8

94.27	4,215,989
107	4,215,990
115	4,215,987
	4,215,991
156	4,215,447
445	4,215,992
448	4,215,988

CLASS 13

9 R	4,216,347
32	4,216,348

CLASS 15

210 R	4,215,448

CLASS 16

50	4,215,449

CLASS 17

11	4,215,450
21	4,215,451
60	4,215,452

CLASS 23

230 B	4,215,993
	4,215,994
230 R	4,215,995
300	4,215,996

CLASS 24

205.16 C	4,215,453

CLASS 28

204	4,215,455

CLASS 29

25.13	4,215,456
25.14	4,215,457
157.3 R	4,215,454
213 R	4,215,458
426.1	4,215,459
429	4,215,460
432	4,215,461
448	4,215,462
461	4,215,463
596	4,215,464
599	4,215,465
623.2	4,215,466
764	4,215,468
835	4,215,469
841	4,215,467

CLASS 30

90.8	4,215,470
147	4,215,471
164.95	4,215,472
172	4,215,473
233	4,215,474
272 R	4,215,475

CLASS 33

27 K	4,215,479
125 C	4,215,480
174 N	4,215,481
181 R	4,215,482
201	4,215,483
265	4,215,484
	4,215,485

CLASS 34

45	4,215,486
167	4,215,487
238	4,215,488
242	4,215,489

CLASS 35

35 A	4,215,490

CLASS 36

8.1	4,215,491
44	4,215,492
51	4,215,493

CLASS 37

42 R	4,215,494
109	4,215,495
117.5	4,215,496

CLASS 40

10 R	4,215,497
21 R	4,215,498
158 R	4,215,499
409	4,215,500
559	4,215,501

CLASS 42

61	4,215,502

CLASS 43

15	4,215,503
24	4,215,504
27.4	4,215,505
42.05	4,215,506
42.22	4,215,507
125	4,215,508

CLASS 44

68	4,215,997

CLASS 46

22	4,215,509
47	4,215,510
175 R	4,215,511
195	4,215,512

CLASS 47

56	4,215,513
67	4,215,514

CLASS 48

214 A	4,215,998

CLASS 49

218	4,215,515

CLASS 51

229	Re.30,357
295	4,215,999
399	4,215,516

CLASS 52

202	4,215,517
658	4,215,518
741	4,215,519

CLASS 53

173	4,215,520
248	4,215,521
378	4,215,522
496	4,215,523
554	4,215,524
580	4,215,525

CLASS 55

138	4,216,000
240	4,216,001
267	4,216,002
356	4,216,003

CLASS 56

12.7	4,215,526
98	4,215,527
400.17	4,215,528

CLASS 57

6	4,215,529
310	4,215,530

CLASS 60

39.63	4,215,533
	4,215,534
262	4,215,536
264	4,215,537
276	4,215,538
278	4,215,539
	4,215,540
284	4,215,541
290	4,215,542
327	4,215,543
398	4,215,544
413	4,215,545
456	4,215,546
465	4,215,547
520	4,215,548
606	4,215,549
	4,215,550
643	4,215,551
646	4,215,552
650	4,215,553
736	4,215,535

CLASS 62

156	4,215,554
324	4,215,555

CLASS 63

15.6	4,215,556

CLASS 65

2	4,216,004
374 R	4,216,005

CLASS 70

417	4,215,557

CLASS 71

88	4,216,006
094	4,216,007
106	4,216,008

CLASS 72

9	4,215,558
77	4,215,559
258	4,215,560
473	4,215,561

CLASS 73

15 FD	4,215,562
23.1	4,215,563
27 R	4,215,564
30	4,215,565
32 A	4,215,566
61.1 R	4,215,567
73	4,215,568
134	4,215,569
141 R	4,215,570
170 A	4,215,571
	4,215,572
255	4,215,573
314	4,215,574
339 A	4,215,575
356	4,215,576
362 SC	4,215,577
382 G	4,215,578
424	4,215,579
425.4 R	4,215,580
431	4,215,581
579	4,215,582
582	4,215,583
626	4,215,584
633	4,215,585

CLASS 74

15.2	4,215,586
22 R	4,215,587
113	4,215,588
422	4,215,591
661	4,215,592
665 D	4,215,593
751	4,215,594
798	4,215,595
851	4,215,596

CLASS 75

0.5 AB	4,216,009
68 A	4,216,010
91	4,216,011
101 R	4,216,012
125	4,216,013
128 C	4,216,014
134 F	4,216,015
141	4,216,016
208 R	4,216,017

CLASS 81

9.1 R	4,215,597
9.5 A	4,215,598
52.4 R	4,215,599
	4,215,600
57.13	4,215,601
57.18	4,215,602

CLASS 82

1.3	4,215,603
20	4,215,604
40 R	4,215,605

CLASS 83

23	4,215,606
111	4,215,607
139	4,215,608
492	4,215,609
565	4,215,610
623	4,215,611
796	4,215,612
864	4,215,613

CLASS 84

1.01	4,215,614
	4,215,615
	4,215,616
1.03	4,215,617
1.24	4,215,618
1.28	4,215,619

CLASS 86

1 R	4,215,620

CLASS 89

1.5 E	4,215,621

CLASS 91

461	4,215,623
499	4,215,624
508	4,215,622

CLASS 92

48	4,215,625

CLASS 93

94 R	4,215,626

CLASS 98

115 LH	4,215,627

CLASS 99

323	4,215,628
403	4,215,629

CLASS 102

10	4,215,630
27 R	4,215,631
92.7	4,215,632
210	4,215,633
228	4,215,634
238	4,215,635

CLASS 104

17 R	4,215,636

CLASS 106

56	4,216,020
73.2	4,216,021
104	4,216,022
293	4,216,023
308 Q	4,216,024

CLASS 110

225	4,215,637

CLASS 112

221	4,215,638
242	4,215,639
264.1	4,215,640
278	4,215,641
410	4,215,642

CLASS 114

36	Re.30,358
218	4,215,643
222	4,215,644
336	4,215,645

CLASS 116

70	4,215,646
286	4,215,647

CLASS 118

622	4,215,648

CLASS 119

15	4,215,649
18	4,215,650
36	4,215,651
51 R	4,215,652
81	4,215,653
97 R	4,215,654

CLASS 122

136 R	4,215,655

CLASS 123

41.44	4,215,658
68	4,215,659
78 E	4,215,660
195 C	4,215,664
198 E	4,215,665
269	4,215,657
447	4,215,662
489	4,215,656
587	4,215,661
590	4,215,663

CLASS 124

41 A	4,215,666

CLASS 126

9 R	4,215,667
60	4,215,668
99 R	4,215,669
164	4,215,670
	4,215,671
419	4,215,672
	4,215,673
438	4,215,674
446	4,215,675
448	4,215,676
450	4,215,677

CLASS 127

61	4,216,025

CLASS 128

6	4,215,678
25 B	4,215,679
33	4,215,680
152	4,215,683
156	4,215,684
	4,215,686
159	4,215,685
169	4,215,687
204.21	4,215,681
205.29	4,215,682
214 F	4,215,689
214 R	4,215,688
221	4,215,690
260	4,215,691
287	4,215,692
296	4,215,693
303.1	4,215,694
350 V	4,215,695
641	4,215,696
731	4,215,697
734	4,215,698
748	4,215,699
763	4,215,700
	4,215,701
766	4,215,702
772	4,215,703

CLASS 131

17 R	4,215,704
70	4,215,705
143	4,215,706
173	4,215,707
262 B	4,215,708

CLASS 132

9	4,215,709
40	4,215,710

CLASS 134

4	4,216,026
36	4,216,027

CLASS 135

19.5	4,215,711

CLASS 136

234	4,216,028

CLASS 137

39	4,215,712
238	4,215,713
269	4,215,714
505.18	4,215,715
527.4	4,215,716
533.25	4,215,717
543.19	4,215,718
563	4,215,719
596.2	4,215,720
606	4,215,721
625.3	4,215,722
625.63	4,215,723
852	4,215,724
855	4,215,725

CLASS 138

30	4,215,726
112	4,215,727

CLASS 139

370.2	4,215,728
384 B	4,215,729

CLASS 141

1	4,215,730

CLASS 144

136 C	4,215,731
145 A	4,215,732

CLASS 148

1.5	4,216,029
	4,216,030
2	4,216,031
6.15 Z	4,216,032
16.6	4,216,033
20.3	4,216,034
23	4,216,035
175	4,216,036
	4,216,037
187	4,216,038

CLASS 149

19.4	4,216,039
21	4,216,040
44	4,216,041

CLASS 152

171	4,215,733
209 WT	4,215,734
354 R	4,215,735
361 R	4,215,736
362 R	4,215,737

CLASS 156

62.2	4,216,042
169	Re.30,359
193	4,216,043
215	4,216,044
242	4,216,045
252	4,216,046
285	4,216,047
344	4,216,048
433	4,216,049
494	4,216,050
499	4,216,051
502	4,216,052

CLASS 159

48 R	4,216,053

CLASS 162

57	4,216,054
117	4,216,055
300	4,216,056

CLASS 164

49	4,215,738
416	4,215,739
446	4,215,740

CLASS 165

11 R	4,215,741
51	4,215,742
141	4,215,743
158	4,215,744
160	4,215,745

CLASS 166

53	4,215,746
85	4,215,747
322	4,215,748
361	4,215,749

CLASS 168

4	4,215,750

CLASS 169

51	4,215,751
58	4,215,752

CLASS 174

50	4,216,349

68.5 4,216,350
92 4,216,351

CLASS 175

17 4,215,753

CLASS 176

37 4,216,057
39 4,216,058
87 4,216,059

CLASS 177

137 4,215,754

CLASS 178

19 4,216,352

CLASS 179

1 GJ 4,216,353
15.55 R 4,216,354
18 AB 4,216,355
99 LS 4,216,356
100.1 R 4,216,357

CLASS 180

6.44 4,215,755
127 4,215,756
4,215,757
128 4,215,758
168 4,215,759
176 4,215,760

CLASS 181

152 4,215,761
201 4,215,762
202 4,215,763
286 4,215,764
287 4,215,765

CLASS 182

46 4,215,766

CLASS 188

73.3 4,215,768
265 4,215,767

CLASS 190

18 A 4,215,769

CLASS 191

23 R 4,215,770

CLASS 192

3.54 4,215,771

CLASS 193

35 A 4,215,772

CLASS 194

9 R 4,215,773

CLASS 198

444 4,215,774
781 4,215,775
823 4,215,776

CLASS 200

67 D 4,216,358
144 B 4,216,359
4,216,360
4,216,361
153 S 4,216,362
157 4,216,363
164 R 4,216,364

CLASS 202

139 4,216,060
248 4,216,061
4,216,062

CLASS 203

91 4,216,063

CLASS 204

1 T 4,216,064
4,216,065
59 QM 4,216,066
129 4,216,067
195 R 4,216,068
4,216,069
197 4,216,070
242 4,216,071
252 4,216,072
296 4,216,073

CLASS 206

63.3 4,215,777
314 4,215,778
421 4,215,779
424 4,215,780
434 4,215,781
525 4,215,782
626 4,215,783

CLASS 208

8 LE 4,216,074
35 4,216,075
48 AA 4,216,076
57 4,216,077
143 4,216,078
188 4,216,079

CLASS 209

8 Re.30,360
10 4,216,082
469 4,216,080
496 4,216,081

CLASS 210

31 R 4,216,083
32 4,216,084
44 4,216,085
47 4,216,086
58 4,216,087
59 4,216,088
63 R 4,216,089
169 4,216,090
175 4,216,091
222 4,216,092
247 4,216,093
331 4,216,094
512 R 4,216,095

CLASS 211

105.2 4,215,784

CLASS 215

11 C 4,215,785
231 4,215,786

CLASS 219

60 A 4,216,365
78.15 4,216,366
132 4,216,367
4,216,368
411 4,216,369
460 4,216,370
501 4,216,371
521 4,216,372

CLASS 220

3.6 4,215,787
22 4,215,788
96 4,215,789
240 4,215,790
258 4,215,791
268 4,215,792
270 4,215,793
4,215,794
276 4,215,795
306 4,215,796
359 4,215,797
421 4,215,798

CLASS 221

93 4,215,799
129 4,215,800

CLASS 222

63 4,215,801
146 H 4,215,802
240 4,215,803
321 4,215,804

CLASS 226

97 4,215,805
195 4,215,806

CLASS 227

21 4,215,807
146 4,215,808

CLASS 228

48 4,215,809

CLASS 229

33 4,215,810

CLASS 235

88 R 4,216,373
98 R 4,215,811
382 4,216,375
448 4,215,813
493 4,215,812

CLASS 236

1 G 4,215,814
46 R 4,215,815
99 E 4,215,816

CLASS 237

2 B 4,215,817

CLASS 239

3 4,215,818
81 4,215,819
90 4,215,820
533.4 4,215,821
542 4,215,822
553.3 4,215,823
655 4,215,824

CLASS 241

34 4,215,825
207 4,215,826

CLASS 242

55.01 4,215,827
84.8 4,215,828
107 4,215,829
4,215,830
158 F 4,215,831

CLASS 244

16 4,215,832
17.11 4,215,833
97 4,215,834
122 AG 4,215,835
138 R 4,215,836

CLASS 246

433 4,215,837

CLASS 248

121 4,215,838
170 4,215,839
221.4 4,215,840
562 4,215,842
635 4,215,841

CLASS 249

78 4,215,843

CLASS 250

201 4,216,378
214 P 4,216,379
255 4,216,380
357 4,216,376
363 S 4,216,381
408 4,216,382
439 P 4,216,383
539 4,216,096
574 4,216,377

CLASS 251

28 4,215,844
63 4,215,845
298 4,215,846
317 4,215,847

CLASS 252

8.55 D 4,216,097
4,216,098
33.6 4,216,099
46.7 4,216,100
63.2 4,216,101
4,216,102
4,216,103
63.5 4,216,106
91 4,216,104
174.19 4,216,105
182 4,216,107
4,216,108
299 4,216,109
301.1 R 4,216,110
301.23 4,216,111
316 4,216,112
317 4,216,113
341 4,216,114
400 R 4,216,115
404 4,216,116
408 4,216,117
415 4,216,118
429 R 4,216,119
430 4,216,120
431 C 4,216,121
448 4,216,122
466 J 4,216,123
518 4,216,124
527 4,216,125

CLASS 254

107 4,215,848
277 4,215,851
326 4,215,849
350 4,215,850

CLASS 260

5 4,216,126
8 4,216,127
4,216,128
22 D 4,216,129
29.7 R 4,216,130
33.6 AQ 4,216,131
4,216,132
38 4,216,133
40 R 4,216,134
4,216,135
4,216,136
42.46 4,216,137
45.75 B 4,216,138
45.75 C 4,216,139
45.75 R 4,216,140
112.5 R 4,216,141
4,216,142
113 4,216,143
115 4,216,144
156 4,216,145
202 4,216,146
207 4,216,147
243.3 4,216,148
326 S 4,216,149
326.2 4,216,150
326.5 FN 4,216,151
326.5 S 4,216,152
343.21 4,216,154
343.3 R 4,216,153
345.2 4,216,155
348.38 4,216,156
365 4,215,157
396 N 4,216,158
397.1 4,216,159
455 R 4,216,160
456 A 4,216,161
468 F Re.30,361
500.5 H 4,216,162
502.5 4,216,163
506 4,216,164
507 R 4,216,165
4,216,166
558 D 4,216,167
567.6 M 4,216,168
583 EE 4,216,170
583 P 4,216,169
584 B 4,216,171
654 R 4,216,173

CLASS 261

30 4,216,174
39 D 4,216,175
142 4,216,176

CLASS 264

9 4,216,178
25 4,216,177
4,216,179
35 4,216,180
51 4,216,181
71 4,216,182
80 4,216,183
229 - 4,216,184

CLASS 266

89 4,215,852
235 4,215,853
240 4,215,854
259 4,215,855

CLASS 272

3 4,215,856
101 4,215,857

CLASS 273

1 R 4,215,858
23 4,215,859
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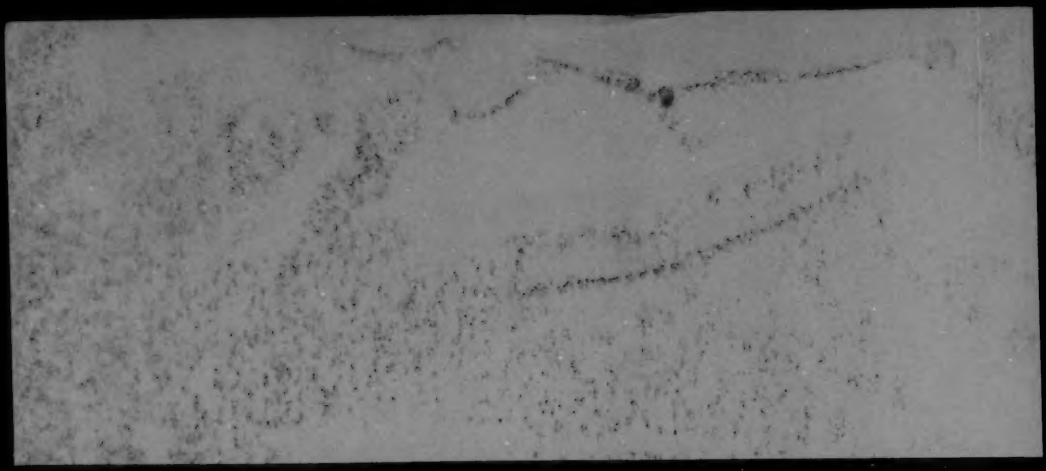

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